

JOTTINGS
ABOUT BIRDS.

Charles Dixon



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ETC., ETC.

PART AUTHOR OF 'A HISTORY OF BRITISH BIRDS.'



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JOTTINGS ABOUT BIRDS

By CHARLES DIXON

With Coloured Frontispiece by J. Smit

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PREFACE.

THE following pages deal with bird-life under many aspects and in various lands. Notwithstanding this latter fact, I have no hesitation in saying that the chapters dealing with a more cosmopolitan ornithology appeal even to the reader whose researches embrace British birds alone. No student of ornithology can well confine his work to the birds of a single region, or even of many regions; for he will invariably find that the deeper he attacks his subject the wider he will have to roam. This applies not only to affinities, but to habits and instincts as well. I am heartily glad to see a growing taste for this wider study amongst British naturalists, especially in the younger generation; it is a healthy sign, and will serve to place the work of the future on a sound foundation.

More particularly would I like to call the attention of the reader to the chapter on the Ornithology

of Algeria. The account there presented is, I believe, the most complete one in the English language, so far as species are concerned, and is founded on a visit to the country. Should I succeed in enticing even one fresh worker to a wide and little known field, it will be a source of much gratification. Algeria is easily reached, and yearly becoming more popular as a winter resort.

The chapters on the birds of the more remote parts of our own islands may possibly be of service to the reader who contemplates visiting these places, or may even suggest a journey thereto; whilst the few remarks on the Birds' place in Art, from a naturalist's point of view, I especially commend to the painters who utilize, or contemplate utilizing, birds in their work.

My thanks are due to Capt. Elwes for kindly placing one of the type specimens of *Saxicola seelohmi* at my service (but two examples of this bird are yet known to science), from which the coloured frontispiece to the present volume was taken. The other specimen was figured in *The Ibis* when I described the species.

CHARLES DIXON.

September, 1893.

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JOTTINGS ABOUT BIRDS.

I.

THE BIRDS OF ALGERIA.

No portion of the Western Palæarctic region so abounds in ornithological interest, or is so likely to reward research, as that which Dr. Sclater describes as the Cisatlantean sub-region. This sub-region practically consists of Africa north of the Great Desert from Barbary to Morocco, including the Atlantic islands off the West African coast. Of this wide area I am probably correct in saying that the Algerian portion is the most interesting, and (with Tunis) the most likely to repay careful investigation. The important ornithological discoveries made of late years in the Atlantic islands by Canon Tristram, Mr. Meade-Waldo, and Dr. Koenig, show how little we really know of this area, and more especially of the

continental portion of it. I am not aware that any important contribution has been made to the ornithology of Algeria during the past ten years, or since my own paper on the subject appeared in the *Iltis* (1882), although Dr. Koenig has published a long and important article on the avifauna of Tunis (*Journal für Ornithologie*, 1888, p. 121). In the present chapter I will endeavour to bring the ornithology of Algeria up to date, to give as complete a list of its avifauna as our present knowledge permits, offering it as an instalment of what I hope soon will be completed, viz. a work on the birds of the entire sub-region. The earlier workers at Algerian ornithology include such distinguished ornithologists as Canon Tristram, Mr. Salvin, Taczanowski, and M. Loche. The first-named naturalist may be regarded as the pioneer, and to his efforts we owe the most important part of our knowledge of the various desert species.

A few words on the physical characteristics of the region may aptly serve as an introduction to our study of its avifauna, and enable the reader better to understand the peculiarities presented. Geographically speaking, Algeria and the adjoining provinces form a region practically unique. So far as regards their fauna and flora, they are as

effectually isolated from the remainder of Africa as if the sea itself divided them. Indeed, the barrier of desert sand that surrounds them on the south and east has proved even more effectual in barring the spread of bird-life northwards, so that their avifauna shows much more affinity with Europe than with the Ethiopian region. North Africa from Morocco to Barbary is as completely an island as if the Mediterranean surrounded it, and in many respects its resident avifauna is of a strictly insular character. We find numbers of European or Atlantic island species represented by peculiar forms, and these again in many cases are replaced by desert races, as we proceed southwards into the Sahara. The variety in the physical aspect of this region is very great, consequently the avifauna is of an equally diversified character. The great chain of the Atlas, whose highest peaks are upwards of 7,500 feet above sea-level, retaining a snowy mantle until June, runs from east to west throughout the northern portion of the entire region, and has a considerable influence on its avifauna, climatically and otherwise. The region is divided into three very distinct areas, each of which is characterized by a more or less specialized fauna. From the coast southwards to the Atlas we have the region of

the Tell, a richly fertile area, wooded in parts, and clothed with a varied and luxuriant vegetation. From the southern slopes of the Atlas to the region where all regular water supply fails, is known as the Sahara, sandy, yet sufficiently fertile for pastoral purposes, replete with oases of wonderful beauty and almost tropic luxuriance. Beyond this, again, we enter the Desert region, a rainless almost waterless area of interminable sandy arid wastes, destitute of vegetation except in the few scattered oases, which extend in drear monotony southwards to the water system of the Niger. We may again very conveniently divide the central of these three regions, the Sahara, into three well-defined sub-regions, viz. the Hauts Plateaux, or the high lands or steppes of the Atlas; the Dayats, or region where the water supply is intermittent and inconstant; and beyond this again the area of the plains. Birds in great variety find here a congenial home, or a fitting refuge from the winters of Europe. The rich plains and mountain forests, the lakes and the vast marshes (many of these, alas! are now drained through French enterprise, and their feathered denizens banished), the crags and precipices of the Atlas; the verdant oases, the bare mountain slopes, and the varied

unequal ground of the Desert, each and all support a bird population characteristic in its features, almost endless in its variety. Such wide variations of temperature, and such notable changes in climate in summer and winter, must necessarily affect the avifauna of Algeria. Migration therefore prevails in a very remarkable manner. Not only do we find much regular migration across the country in spring and autumn, of species breeding to the north and wintering to the south, but we find also that Algeria is the winter quarters of vast numbers of birds that breed in Europe, especially in the British Islands. Perhaps of even greater interest to the student of migration are the local movements and vertical migrations of many of the resident species—of birds that come up from the Desert oases in spring to breed in the wooded mountains of the Atlas ; and of others that visit the high mountain regions in summer, where a suitable temperature prevails, and retire in autumn to the plains. For further particulars I would refer the reader to *The Migration of Birds*, pp. 136, 137. Perhaps the most characteristic features of the Algerian avifauna are its richness in desert species, its singular abundance of Chats and Larks. As regards the winter aspects of the Sahara region,

a season of which I have had no experience, they are admirably expressed by Canon Tristram thus : “Each portion of the Sahara—the rocky ridges, the sand drifts, the plains, the chotts or salt plains,—has its peculiar ornithological characteristics. But by far the most interesting localities are, as might have been anticipated, the dayats and the oases. Here are the winter quarters of many of our familiar summer visitants. The Chiffchaff, Willow Wren, and Whitethroat hop on every twig in the gardens shadowed by the never-failing palm ; the Swallow and the Window Martin thread the lanes, and sport over the mouths of the wells in pursuit of the swarming mosquitoes ; the Hoopoe solemnly stalks on every dunghill, a cherished and respected guest ; the White Shrike perches motionless on the extremity of the palm-leaf ; while a pair or more of the Egyptian Turtle Dove nestle in the centre of almost every tree ; and a random shot is pretty sure to start from under the dates a dozing ‘Booma,’ or Little Owl. These peaceful retreats seem to be rarely visited by any Raptor more formidable than the Kestrel. Not so in the dayats. Here the Golden Eagle, the Royal and Arabian Kites, hold court and courtship, and carry on a perpetual though bloodless warfare with the Raven.

The shrubs are occupied by the Shrike, by small flocks of the long-tailed Numidian *Malurus*, and the lovely little Moussier's Warbler, whom I might almost term the ornithological feature of the day; whilst, heard but not seen, the Dartford Warbler chirps forth his incessant *pittéchou, pittéchou*. If you wish to make acquaintance with the tribe of the Rockchats and Wheatears, you must follow the marmots to the rocky defiles of extinct streams, the 'Weds' of the Bedouin. The hard, gravelly plains are the homes of the Sand Grouse, and the various thick-billed and stout-billed Larks; while the loose sands vainly conceal the burrowing beetles from the long bills of the Ground-Larks. On the surface of the chotts the little Plovers and other *Grallatores* incessantly run along, as if awaiting the returning tide of the primeval ocean which once swept over them."

So far the winter features of the Sahara; but with the return of spring a great change comes over the scene. True the various endemic species of the Desert remain behind, but the Warblers and the Bushchats, the Eagles and the Plovers, retire far to the north, many to cross the Mediterranean to European haunts. The temperature becomes too high for the various local and vertical migrants,

and they seek the more northern oases, the forests of the Atlas, and the fertile lands between that range and the coast. The Tawny Pipits and the Calandra Larks betake themselves to the cultivated fertile northern plains and plateaux; many of the Chats seek the hillsides and bare rocky defiles. Then appear the various migrants that are journeying up from more southern regions of Africa—far south beyond the Great Desert, from the Soudan, from Central Africa and the Cape—the Spotted Flycatcher, the Woodchat Shrike, the Sedge Warbler, the Reed Warbler, the Wood Wren, the Whitethroat, Swallows of various species, the Cuckoo, the Wryneck, Turtle Doves, and many others—all on their way north to cross the Mediterranean, although a few individuals of some species stay their flight and remain in the fertile Tell for the summer. The mountain forests soon fill with Rollers, Doves, and other woodland species; the rocky passes and gorges are enlivened once more with the Rock Martin and the Whitebellied Swift. The White Stork also appears upon the scene, and visits once more its old nests on the cliffs and the mosque towers; and such birds as Coursers and Sand Grouse leave in varying numbers the more remote fastnesses of the Desert

to breed on the northern plains of the Dayats. Nothing can exceed the beauty of these oases in spring, when they literally swarm with birds and resound with song. One very remarkable feature is the general lateness of the breeding season in Algeria, a phenomenon which I believe is also peculiar to the valley of the Danube, and which may be attributed to the long spell of spring-like weather prevailing in these areas. Birds are in no hurry to commence nesting. Even such early species as Chaffinches and Larks I found had only just commenced laying at the middle of May, and the House Martins were only building nearly a fortnight later still. The Vultures, Ravens, and some few other species breed much earlier, however, and their young were reared by that date.

We will now proceed to tabulate the various species that are found in the country, and to give a few particulars concerning each. Want of space, however, prevents this portion of the subject from being treated in any very elaborate or detailed manner.

1. THE OSTRICH *Struthio camelus*, Linnæus, is an inhabitant of the vast plains of the southern desert, but thinly dispersed, and said to be rapidly becoming rarer. This species is gregarious in its habits, living

in small parties, each band confining itself to a comparatively small area of country.

2. THE BARBARY PARTRIDGE *Caccabis petrosa* (Gmelin), is commonly distributed throughout the mountain districts. I met with it throughout the Djebel Aurés. It frequents the wooded hills as much as the bare and scrub-clothed mountain-sides and the barley-fields. The nesting season begins late in May. Two nests I took were mere hollows, one under a juniper bush, the other beneath the shelter of a grass tuft. The loud monotonous note of *cawee-cawee* is kept up very persistently. It would appear that there is a desert race of this species, as Canon Tristram remarks that examples obtained by him in the desert were smaller and paler.

3. THE QUAIL *Coturnix communis*, Bonnaterre, passes the Sahara on spring and autumn migration, and is generally distributed throughout the cultivated districts of the Tell, where it breeds.

4. THE BLACK-BELLIED SAND GROUSE *Pterocles arenarius* (Pallas), is universally distributed throughout the Sahara, but is replaced by the Senegal Sand Grouse in the more southern deserts. This Sand Grouse lives in parties during the autumn and winter. It is most active towards

dusk, and the note, uttered incessantly until after dark, is said by Canon Tristram to resemble that of a Partridge. The eggs, laid on the bare sand, are invariably three.

5. THE PINTAILED SAND GROUSE *Pterocles alchata* (Linnæus), is also extremely common in the central and desert areas. In its habits it closely resembles the preceding species.

6. THE SPOTTED SAND GROUSE *Pterocles coronatus*, Lichtenstein, is confined apparently to the remote southern deserts.

7. THE SENEGAL SAND GROUSE *Pterocles senegalensis*, Shaw, is also an inhabitant of these remote desert regions. Canon Tristram asserts that he saw another species of Sand Grouse near Waregla, the most southern oasis he visited (lat. 32°), but was unable to obtain examples. There can be little doubt that many other species remain to be discovered upon these vast awful plains of the Libyan Desert.

8. THE ANDALUCIAN HEMIPODE *Turnix sylvatica* (Desf.), is said by Taczanowski not to be rare amongst the shrubberies at the foot of the mountains, but I did not have the good fortune to meet with it anywhere in the province of Constantine.

9. THE ROCK DOVE *Columba livia*, Brisson, is commonly distributed throughout all the rocky

districts, even in the most sterile areas of the Tell and the Sahara.

10. THE STOCK DOVE *Columba ænas*, Linnæus, is somewhat sparingly distributed throughout the wooded districts. This species is not included by Taczanowski, nor did I meet with it in Constantine.

11. THE RING DOVE *Columba palumbus*, Linnæus, was not met with by Canon Tristram, nor is it included in Taczanowski's catalogue. I met with this species in various parts of the cedar forests on the Djebel Aurés, near Batna. It is by no means common.

12. THE EGYPTIAN TURTLE DOVE *Turtur senegalensis* (Linnæus), or Palm Dove, as it is locally known, is a resident in the southern districts, not ranging further north than El Kantara, the highest latitude of the date-palm. With this palm it is inseparably connected, and swarms amongst the groves in astonishing numbers.

13. THE COMMON TURTLE DOVE *Turtur auritus*, Gray, is widely distributed throughout Algeria in summer, but is only known to pass the Sahara sub-region on migration. I observed it both in the oases and amongst the mountain forests. It frequents the date-palms just as much as the preceding species, with which it consorts, but is

not so inseparably associated with that tree. An example I shot at Lambessa in the Aurès was much paler in colouration than the average.

14. THE CORN CRAKE *Crex pratensis*, Bechstein, is a resident in Algeria, but nowhere common, the country not being suited to its requirements, especially in summer. Taczanowski saw it only on one occasion.

15. THE SPOTTED CRAKE *Crex porzana*, Linnæus, is chiefly a winter visitor to Algeria, and at that season is very widely distributed. Taczanowski states that it is to be met with everywhere, but its summer range is undetermined.

16. BAILLON'S CRAKE *Crex bailloni* (Vieillot), is locally a resident throughout Algeria in all portions of the country suited to its requirements. In the Sahara sub-region, as might naturally be supposed, it appears to be only a winter visitant.

17. THE LITTLE CRAKE *Crex parva* (Scopoli), is a local resident in Algeria, but is not included by Taczanowski nor Canon Tristram. I only met with this species in the oasis of Biskra in the Sahara sub-region, where it was apparently breeding.

18. THE WATER RAIL *Rallus aquaticus*, Linnæus, is a resident in Algeria, but is largely increased in numbers in winter by migrants from Europe.

Taczanowski describes it as being scarce in the marshes.

19. THE WATERHEN *Gallinula chloropus*, Linnæus, is a resident, and widely distributed throughout all suitable districts.

20. THE PURPLE GALLINULE *Porphyrio cœruleus* (Vandelli), is a local resident in Algeria. Taczanowski gives the Fezzara Lake as a locality for this species. It has several times been recorded as a British species, but the examples have undoubtedly escaped from ornamental waters.

21. THE COMMON COOT *Fulica atra*, Linnæus, is a resident in Algeria, commonly distributed in all suitable districts. Its numbers are largely increased in autumn by migrants from Europe.

22. THE CRESTED COOT *Fulica cristata*, Gmelin, is a resident, but not so common as the preceding species, according to Taczanowski.

23. THE GREAT CRESTED GREBE *Podiceps cristatus* (Linnæus), is a resident widely distributed, but Canon Tristram states that he never saw this or any other species of Grebe in the south even in localities that appeared suited to them. I saw what was probably this species in the oasis of Biskra. Its numbers are increased in winter by migrants from Europe.

24. THE RED-NECKED GREBE *Podiceps rubricollis* (Gmelin), is said to breed sparingly in Algeria and Morocco, but is chiefly known as a winter visitor. Taczanowski met with this species at the Fezzara Lake.

25. THE BLACK-NECKED GREBE *Podiceps nigricollis*, Brehm, is a resident in Algeria, and is said by Taczanowski to be common at the Fezzara Lake. Canon Tristram assured me that it bred there.

26. THE LITTLE GREBE *Podiceps minor* (Gmelin), is a resident in Algeria, but does not appear to be common. Taczanowski states that a few are to be met with in the small rivers; and Canon Tristram observed it during winter in the northern portion of the Sahara sub-region.

27. THE STORMY PETREL *Procellaria pelagica*, Linnaeus, probably breeds on the coast of Algeria, from Morocco to Barbary. Taczanowski gives Stora as a locality for this species.

28. THE MEDITERRANEAN SHEARWATER *Puffinus kuhli* (Boie), is recorded from Stora, in November, by Taczanowski.

29. THE MANX SHEARWATER *Puffinus anglorum* (Temminck), breeds on various islands in the Mediterranean, and may be fairly included in the present list. The breeding areas of these Shear-

waters are as yet very imperfectly known, and it may ultimately be discovered that both species breed on the mainland of the Algerian coast.

30. THE BLACK TERN *Sterna nigra*, Linnæus, is a resident in Algeria and breeds in various marshes; it is, however, more abundant in winter than in summer. According to Canon Tristram, this and the following species of Tern marked with an asterisk are only found in the Western Sahara, chiefly on the great lakes of Zahrez, and never further south.

31. *THE WHITE-WINGED BLACK TERN *Sterna leucoptera*, Meisner and Schinz, is said to breed in Algeria, but particulars of its distribution are wanting.

32. *THE WHISKERED TERN *Sterna hybrida*, Pallas, breeds in moderate numbers in Algeria. Canon Tristram assured me that it breeds in May on the various fresh-water lakes.

33. *THE GULL-BILLED TERN *Sterna anglica*, Montagu, breeds sparingly in Algeria, but becomes more abundant in winter. Taczanowski states that it breeds in small numbers on the lakes near Constantine, probably those of Tinsilt and Mzouri. Canon Tristram met with it in winter at the Zahrez Lakes.

34. THE CASPIAN TERN *Sterna caspia*, Pallas, is not known to breed in Algeria, but there can be no doubt of its visiting the coasts during winter.

35. THE SANDWICH TERN *Sterna cantiaca*, Gmelin, is not known to breed, but the same remarks apply as those concerning the preceding species.

36. THE COMMON TERN *Sterna fluviatilis*, Naumann, is said by Taczanowski to be rare, but is not known to breed.

37. * THE LESSER TERN *Sterna minuta*, Linnæus, is not known to breed in Algeria, but is a winter visitor or nomadic migrant. According to Taczanowski, it is very common on the coast near Stora.

38. THE ALLIED TERN *Sterna media*, Cretzschmar, is said by Loche to be an occasional visitor to the coasts of Algeria.

39. THE MEDITERRANEAN BLACK-HEADED GULL *Larus melanocephalus*, Natterer, is not known to breed in Algeria, but is a rare visitor to the coasts.

40. THE BLACK-HEADED GULL *Larus ridibundus*, Linnæus, is a winter visitor to Algeria, "common on the coasts and at the mouths of rivers," according to Taczanowski.

41. THE LITTLE GULL *Larus minutus*, Pallas, is probably a winter visitor to the coasts of Algeria, but its distribution is little known.

42. THE COMMON GULL *Larus cauus*, Linnæus, is, as its name implies, an abundant winter visitor to the Algerian littoral.

43. THE SLENDER-BILLED GULL *Larus gelastes*, Lichtenstein, is said by Loche to occur rarely on the coasts of Algeria.

44. THE HERRING GULL *Larus argentatus cachinnans*, Pallas, a sub-specific form of our well-known *Larus argentatus*, being a resident in the Mediterranean basin, may be fairly classed as a visitor to the Algerian coasts.

45. THE LESSER BLACK-BACKED GULL *Larus fuscus*, Linnæus, is a winter visitor to the coasts of Algeria. A few pairs are said by Colonel Irby to breed on the coast of Morocco, in April.

46. THE GREAT BLACK-BACKED GULL *Larus marinus*, Linnæus, is a winter wanderer to the coasts of Algeria. The individuals that stray so far to the south are mostly in immature plumage.

47. THE GLAUCOUS GULL *Larus glaucus*, Fabricus, wanders as far south as the Algerian coasts in winter, individuals so doing being mostly in immature plumage.

48. THE KITTIWAKE *Larus tridactylus*, Linnæus, is a somewhat rare winter straggler to the Algerian coasts. It was only once seen by Taczanowski.

49. THE POMATORHINE SKUA *Stercorarius pomatorhinus*, Temminck, is a rare straggler in winter to the Algerian coasts.

50. RICHARDSON'S SKUA *Stercorarius richardsoni*, Swainson, is a rare straggler to the Algerian coasts in winter, but this species is not known to penetrate far into the Mediterranean, although its range at that season extends as far south as the Cape of Good Hope.

51. BUFFON'S SKUA *Stercorarius buffoni*, Boie, is an occasional visitor to the coasts of Algeria, its range in winter extending up the Mediterranean as far east as the Italian peninsula. Taczanowski records one example.

52. THE WOODCOCK *Scolopax rusticola*, Linnæus, is a common winter visitor to Algeria. It is very possible that some few remain behind in spring to breed on the Atlas range, seeing that the bird is a resident and breeds on the mountains of the Atlantic islands: Madeira, Canaries, and Azores.

53. THE GREAT SNIPE *Scolopax major*, Gmelin, is a somewhat rare winter resident in Algeria, the majority of individuals appearing to pass still further to the south. Taczanowski states that he saw it in March.

54. THE COMMON SNIPE *Scolopax gallinago*,

Linnæus, is a common winter visitor to be met with everywhere in suitable haunts. Loche states that it has been known to breed in Algeria, a fact which seems to me beyond all question.

55. THE JACK SNIPE *Scolopax gallinula*, Linnæus, is a winter visitor to Algeria, but is said by Taczanowski to be rare. Canon Tristram shot this species in the Wed R'hir, about lat. $34\frac{1}{2}^{\circ}$.

56. THE DUNLIN *Tringa alpina*, Linnæus, is a winter visitor, common on the salt marshes, and near the various lakes.

57. THE BROAD-BILLED SANDPIPER *Tringa platyrhyncha*, Temminck, is a winter visitor to Algeria, but its range is very little known.

58. THE LITTLE STINT *Tringa minuta*, Leisler, is a winter visitor to Algeria, but is perhaps most abundant on spring and autumn migration. Taczanowski states that it is found in suitable haunts in both mountain and desert districts.

59. TEMMINCK'S STINT *Tringa temminchi*, Leisler, is a winter visitor to Algeria, frequenting salt marshes and lakes.

60. THE CURLEW SANDPIPER *Tringa subarquata* (Güldenstädt), is a winter visitor, perhaps most abundant on spring and autumn migration.

61. THE SANDERLING *Tringa arenaria*, Linnæus,

is a somewhat rare winter visitor; particulars of its range and movements are almost unknown.

62. THE TURNSTONE *Streptilas interpres* (Linnæus), is a winter visitor to the coasts of Algeria, but its range and movements are little known.

63. THE BLACK-TAILED GODWIT *Limosa melanura*, Leisler, is a winter visitor to the coasts of Algeria; its range is undefined.

64. THE BAR-TAILED GODWIT *Limosa rufa*, Brisson, is also a winter visitor to the coasts, but irregularly dispersed.

65. THE MARSH SANDPIPER *Totanus stagnatilis*, Bechstein, is a winter visitor to Algeria, but doubtless the greater number of individuals pass through on migration in spring and autumn. I met with this species in the oasis of El Outaia in May. Taczanowski observed it at the Fezzara Lake.

66. THE GREENSHANK *Totanus glottis* (Linnæus), is a winter visitor to Algeria, where it is very widely dispersed. Taczanowski states that it is to be met with on the lakes in all parts of the country.

67. THE DUSKY REDSHANK *Totanus fuscus*, Linnæus, is a winter visitor to the lakes and marshes of Algeria. Taczanowski met with this species at the Fezzara Lake.

68. THE COMMON REDSHANK *Totanus calidris*

(Linnæus), breeds, and is a resident in Algeria, becoming much more abundant in winter, at which season Taczanowski describes it as the commonest Sandpiper.

69. THE WOOD SANDPIPER *Totanus glareola* (Gmelin), is a winter visitor to Algeria. Taczanowski states that it was common at the Fezzara Lake. Canon Tristram also met with it widely distributed in the marshes and lakes.

70. THE GREEN SANDPIPER *Totanus ochropus* (Linnæus), is a common winter visitor to Algeria. Taczanowski states that it is to be met with everywhere on the small streams, and Canon Tristram speaks of it as being exceptionally numerous.

71. THE COMMON SANDPIPER *Totanus hypoleucus* (Linnæus), is a very widely distributed winter visitor to Algeria, and is said to breed sparingly in the country.

72. THE RUFF *Totanus pugnax* (Linnæus), is a winter visitor to Algeria, frequenting, according to Taczanowski, all the large sheets of water. Canon Tristram met with this species at Tuggurt.

73. THE GRAY PHALAROPE *Phalaropus fulicarius* (Linnæus), is a very rare nomadic migrant in winter to the coasts of Algeria.

74. THE RED-NECKED PHALAROPE *Phalaropus*

hyperboreus (Linnæus), is an equally rare nomadic winter migrant.

75. THE SLENDER-BILLED OR MEDITERRANEAN CURLEW *Numenius tenuirostris*, Vieillot, is a resident in Algeria, but its numbers are increased in winter by migrants from South Europe. Taczanowski states that it frequents and is very common at the lakes between Batna and Constantine (Tinsilt and Mzouri).

76. THE COMMON CURLEW *Numenius arquata* (Linnæus), is a widely distributed winter migrant to Algeria.

77. THE WHIMBREL *Numenius phæopus* (Linnæus), occurs on spring and autumn migration in Algeria, but whether any individuals remain to winter in the country I am unable to say. Taczanowski states that it is rarer than the Curlew.

78. THE OYSTERCATCHER *Hæmatopus ostralegus*, Linnæus, is a winter visitor to the coasts of Algeria. Whether it ever ascends the rivers or visits the inland lakes appears to be unknown.

79. THE AVOCET *Recurvirostra avocetta*, Linnæus, may possibly still continue to breed in Algeria, but it is perhaps best known as a winter visitor, if uncommon. Taczanowski only met with this species once. Canon Tristram observed it at Tuggurt in January.

80. THE BLACK-WINGED STILT, *Himantopus melanopterus*, Meyer, is a resident in Algeria, breeding near the various lakes, and wintering commonly in the oases, where Canon Tristram asserts that it resorts to the ditches. This species is a very interesting instance of the local migration prevailing so extensively in Algeria.

81. THE COMMON PRATINCOLE *Glareola pratincola* (Linnaeus), breeds commonly in Algeria, but whether Canon Tristram's statement, that this bird is "extremely abundant near marshes or lakes," refers also to its distribution in the country in winter is uncertain. Other evidence points to the fact of this species being only a spring migrant to Algeria, retiring beyond the Desert to winter. Taczanowski did not appear to have met with it.

82. THE CREAM-COLOURED COURSER *Cursorius gallicus* (Gmelin), is a resident on the bare desert plains and amongst the sand-hills in the Sahara; how far southwards its breeding range extends into the Desert sub-region is not known. Canon Tristram asserts that this species is less abundant in winter than in summer, so that there is evidently a southern migration towards the Great Libyan Desert in autumn. The Arab name for this species signifies "Camel-pricker."

83. THE BLACK-BACKED COURSER *Cursorius aegyptius* (Linnæus), has been known to stray abnormally to Algeria. It is an inhabitant of the valley of the Nile from Cairo to about lat. 15°.

84. THE LAPWING *Vanellus cristatus*, Wolf and Meyer, is said to breed sparingly in Algeria, but it may be most correctly described as a regular winter visitor. Canon Tristram states that it is rare, and only found in winter.

85. THE WHITE-TAILED LAPWING *Vanellus leucurus* (Lichtenstein), is doubtfully recorded from Algeria by Loche. This species breeds in Western Turkestan and winters in Northern India, Southern Persia, and North-Eastern Africa. It has occurred abnormally in Southern Russia, Malta, the south of France, and Senegal.

86. THE KENTISH PLOVER *Ægialophilus cantianus* (Latham), is a resident in Algeria, but doubtless subject to much seasonal local migration, and more abundant in winter than in summer. Canon Tristram states that it is universally distributed throughout the Chotts and Sebkhas.

87. THE LITTLE RINGED PLOVER *Ægialitis minor* (Wolf and Meyer), is a resident in Algeria, and probably subject to considerable local migration, moving southwards to an appreciable extent in

winter. Canon Tristram states that it is not so common as the preceding species. I remarked many pairs of this plover in the oasis of Biskra (lat. 35°) in May.

88. THE RINGED PLOVER *Ægialitis hiaticula* (Linnæus), is said to breed sparingly in Algeria, but is better known as a winter visitor. Its distribution is very imperfectly defined.

89. THE DOTTEREL *Eudromias morinellus*, Linnæus, is a winter visitor to Algeria, and is widely distributed. Canon Tristram found it in vast flocks on the plains where there was any vegetation. Taczanowski states that it was common on the uplands near Ghelma and Constantine. Probably many individuals cross Algeria to still more southern haunts.

90. THE GRAY PLOVER *Charadrius helveticus* (Brisson), is a winter visitor to Algeria, but its distribution is very imperfectly known.

91. THE GOLDEN PLOVER *Charadrius phuvialis*, Linnæus, is a winter visitor to Algeria.

92. THE STONE CURLEW *Ædicnemus crepitans*, Temminck, is a resident and breeds in Algeria. Taczanowski states that it is common in the desert—probably in winter. Canon Tristram met with it on the Hauts Plateaux. Its numbers are in-

creased during winter. Intermediate forms between this Stone Curlew and the Indian Stone Curlew, *Œ. crepitans indicus*, Salvadori, are said to occur in North Africa "from Morocco to Egypt." (*Seebohm.*)

93. THE GREAT BUSTARD *Otis tarda*, Linnæus, probably does not now breed anywhere in Algeria—certainly information of the fact is wanting—and is only known as a rare straggler in winter.

94. THE LITTLE BUSTARD *Otis tetrax*, Linnæus, is a common and widely distributed species, breeding in the north and retiring for the most part to the Sahara in winter. Taczanowski describes it as inhabiting the plateaux of the Atlas; Canon Tristram only met with it in the north, on the outskirts of cultivation.

95. THE HOUBARA BUSTARD *Otis undulata* (Jacquin), is a resident in Algeria, said by Taczanowski to be not rare in the desert and on the adjoining plateaux. Canon Tristram met with it in the Central Sahara, and states that it was most abundant near dayats.

96. THE COMMON CRANE *Grus communis*, Bechstein, is a regular winter visitor to Algeria.

97. THE DEMOISELLE CRANE *Grus virgo* (Linnæus), is a resident in Algeria, breeding locally in suitable marshes. Taczanowski met with this species in the desert near Biskra, probably in winter.

98. THE COMMON HERON *Ardea cinerea*, Linnæus, is a winter visitor to Algeria: I am not aware that it breeds in the country. Taczanowski states that it is rare.

99. THE PURPLE HERON *Ardea purpurea*, Linnæus, is a winter visitor to Algeria.

100. THE BLACK-NECKED HERON *Ardea melanocephala*, Childr., is of only accidental occurrence in Algeria, according to Loche.

101. THE GREAT WHITE EGRET *Ardea alba*, Linnæus, is a winter visitor to Algeria; whether it breeds here I am unable to say.

102. THE LITTLE EGRET *Ardea garzetta*, Linnæus, is a winter visitor to Algeria; its breeding range, if any, is yet undetermined.

103. THE BUFF-BACKED HERON *Ardea bubulcus*, Audouin, is a resident, and breeds in suitable districts in Algeria. Taczanowski states that it was rare, but gives the Fezzara Lake as a locality for this species.

104. THE SQUACCO HERON *Ardea comata*, Pallas, is a resident and breeds in Algeria, but owing to drainage many of its haunts have been destroyed—a statement, by the way, which applies to numerous other species.

105. THE NIGHT HERON *Nycticorax griseus* (Lin-

næus), is a resident and breeds in Algeria, but details of its distribution, especially in summer, are wanting.

106. LITTLE BITTERN *Ardetta minuta* (Linnæus), is a resident and breeds in Algeria, its numbers being increased in winter.

107. THE BITTERN *Botaurus stellaris* (Linnæus), is a resident and breeds in Algeria, its numbers being increased in winter. Taczanowski states that it frequents the mountain lakes as well as the desert marshes. Canon Tristram remarks that both this and all the above species of the Heron tribe were especially common in the Wed R'hir and in the remote oasis of Waregla (lat. 32°).

108. THE WHITE STORK *Ciconia alba*, Bechstein, is a well-known and abundant spring migrant, breeding in all localities suited to its requirements, arriving, according to Taczanowski, in March, and leaving, as remarked by Canon Tristram, in November. It was observed breeding on the Mosque towers in the M'zab country far in the Desert in lat. 33°—34°. I remarked it most abundant near Constantine. Incubation takes place in June.

109. THE BLACK STORK *Ciconia nigra* (Linnæus), is said to be only a winter visitor to Algeria; its distribution is little known.

110. THE MARABOUT STORK *Leptoptilus*, sp.

inc., mentioned by Taczanowski, is still, I believe, undetermined.

111. THE SPOONBILL *Platalea leucorodia*, Linnæus, is said to be a resident in Algeria, but its breeding range appears to be undetermined. Neither Canon Tristram nor Taczanowski allude to this species.

112. THE RED-CHEEKED IBIS *Ibis comata* (Rüppell), is said to be a resident in Algeria. It was found by Canon Tristram frequenting only the most desolate and arid mountain ranges, consorting with Falcons and Ravens. It breeds in the most inaccessible precipices, and its food consists of lizards and snakes.

113. THE GLOSSY IBIS *Plegadis falcinellus* (Linnæus), is rare according to Canon Tristram. He observed it at Tuggurt on the Wed R'hir. This Ibis is said to breed in Algeria, but information is much to be desired.

114. THE FLAMINGO *Phænicopterus roseus*, Pallas, is a resident in Algeria, but many of its accustomed haunts have been drained. Taczanowski states that it is common in March on the salt lakes of Tinsilt and Mzouri, but I failed to see it there in May. Canon Tristram states that he saw a large flock at Waregla, in lat. 32°.

115. THE GRAY-LAG GOOSE *Anser cinereus*, Meyer, is a winter visitor to Algeria. Taczanowski observed this species at the Fezzara Lake in December.

116. THE BEAN GOOSE *Anser segetum* (Gmelin), is a winter visitor to Algeria, where it was observed by Taczanowski at the Fezzara Lake in December. Canon Tristram shot an example at Temacin.

117. THE BRENT GOOSE *Bernicla brenta* (Brisson), is a rare straggler to the Algerian littoral during winter.

118. THE RED-BREASTED GOOSE *Bernicla ruficollis* (Pallas), may occasionally wander to Algeria in winter, as skins of this species, said to have come from this country, were offered for sale in London nine years ago.

119. THE EGYPTIAN FOX GOOSE, *Chenalopex ægyptiaca* (Linnæus), is doubtfully included on the authority of Taczanowski, who states that it frequents the lake near Batna.

120. THE HOOPER SWAN *Cygnus musicus*, Bechstein, is a rare wanderer to Algeria in exceptionally severe winters.

121. THE MUTE SWAN *Cygnus olor* (Gmelin), is a regular winter visitor to the lakes of Algeria: whether it breeds in the country in a wild state appears not to be known.

122. THE COMMON SHELDRAKE *Tadorna cornuta* (S. G. Gmelin), is a winter visitor principally, but a few apparently remain to breed.

123. THE RUDDY SHELDRAKE *Tadorna casarca* (Linnæus), is a common winter visitor to the lakes of Algeria, many, however, breeding in various parts of the country. Hundreds were observed by Canon Tristram on the small sheets of open water near Tuggurt and elsewhere. It breeds in holes in cliffs, often far from water. Taczanowski gives the lakes near Batna as a locality for this species.

124. THE GADWALL *Anas strepera*, Linnæus, is principally a winter visitor to Algeria, where it frequents the lakes and marshes. A few, however, remain to breed in spring. Taczanowski found it fairly common near the Fezzara Lake and Constantine.

125. THE PINTAIL DUCK *Anas acuta*, Linnæus, is a regular winter visitor to Algeria.

126. THE WIGEON *Anas penelope*, Linnæus, is a very common winter visitor to Algeria, and said by Taczanowski to be met with everywhere on the lakes.

127. THE TEAL *Anas crecca*, Linnæus, is a common winter visitor to Algeria, and, according to Canon Tristram, breeds in the country in small numbers.

128. THE GARGANEY *Anas circia*, Linnæus, is a winter visitor to Algeria, but I am assured by Canon Tristram that it breeds there in small numbers. Taczanowski states that it is rarer than the preceding species.

129. THE SHOVELLER *Anas clypeata*, Linnæus, is best known as a winter visitor to Algeria, but it breeds there in small numbers.

130. THE MALLARD *Anas boschas*, Linnæus, is a resident in Algeria, but its numbers are vastly increased in winter. Canon Tristram picked up an example of this species which had died of starvation in the centre of the Souafa Desert!

131. THE MARBLED DUCK *Anas angustirostris* (Ménétries), occurs throughout Algeria.

132. THE POCHARD *Fuligula ferina* (Linnæus), is a fairly common winter visitor to Algeria. It is said, however, that this species formerly bred sparingly in the country.

133. THE RED-CRESTED POCHARD *Fuligula rufina* (Pallas), breeds commonly on the lakes in Algeria, but is more abundant and more widely dispersed in winter. It lays in June.

134. THE WHITE-EYED POCHARD *Fuligula nyroca* (Güldenstädt), is a resident and breeds in Algeria. Common in the Wed R'hir.

135. THE SCAUP *Fuligula marila* (Linnæus), may probably visit Algeria in winter, but the evidence is not very conclusive.

136. THE TUFTED DUCK *Fuligula cristata* (Leach), is a winter visitor to Algeria. Canon Tristram remarked its abundance in the Wed R'hir.

137. THE GOLDEN-EYE *Clangula glaucion* (Linnæus), is a very rare straggler in winter to the coasts of Algeria.

138. THE COMMON SCOTER *Ædemia nigra* (Linnæus), may very exceptionally wander in winter to the coasts of Algeria.

139. THE WHITE-HEADED DUCK *Erismatura leucocephala* (Scopoli), is a resident and breeds in Algeria.

140. THE GOOSANDER *Mergus merganser* (Linnæus), is a somewhat scarce straggler to the Algerian coasts.

141. THE RED-BREASTED MERGANSER *Mergus serrator*, Linnæus, occasionally wanders as far to the south as the Algerian coasts in winter.

142. THE SMEW *Mergus albellus*; Linnæus, is an occasional winter visitor to the coasts of Algeria.

143. THE GANNET *Sula bassana* (Linnæus), wanders up the Mediterranean to the Algerian coasts in winter, but only exceptionally.

144. THE CORMORANT *Phalacrocorax carbo* (Linnæus), is best known as a winter visitor to Algeria, but is said to breed in one or two localities.

145. THE SHAG *Phalacrocorax graculus* (Linnæus), is a resident, and frequents such parts of the coast as are suited to its habits. This race of the Shag, found in the Mediterranean basin, has been separated under the name of *P. desmaresti*, but on apparently insufficient grounds.

146. THE PYGMY CORMORANT *Phalacrocorax pygmaeus*, Pallas, is a resident in Algeria. Loche states that this species breeds on the Fezzara Lake.

147. THE DALMATIAN PELICAN *Pelecanus crispus*, Bruch., is said by Loche to be of very rare and accidental occurrence in Algeria.

148. THE OSPREY *Pandion haliaëtus* (Linnæus), is best known as a winter resident, but a few pairs remain to breed.

149. THE BEARDED VULTURE *Gypaëtus barbatus* (Linnæus), is a resident in Algeria and widely distributed, if nowhere very common. Canon Tristram only met with it in the north of the Sahara, but Taczanowski observed it to be most numerous near Batna. It probably breeds here, and had finished nesting when I was at that place in April and May. In its habits it is unsociable.

150. THE GRIFFON VULTURE *Gyps fulvus* (Gmelin), is a common resident in Algeria, widely distributed, but most abundant perhaps in mountainous districts. I counted ten of these fine birds in the air together on one occasion near Batna. Breeds in colonies.

151. THE CINEREOUS VULTURE *Vultur monachus*, Linnæus, is a resident and generally distributed. It is said by Taczanowski to be the commonest Vulture in the country, but this is not borne out by my experience.

152. THE EGYPTIAN VULTURE *Neophron percnopterus* (Linnæus), is more or less a resident in Algeria, but not so common as the Griffon Vulture. Neither does it ever breed in colonies.

153. THE GOLDEN EAGLE *Aquila chrysaëtus*, Linnæus, is a resident in Algeria. According to Canon Tristram, it is never seen in the desert nor the inhabited oases, but frequents the rocky mountain ranges and the dayats, where the same authority states that it is almost gregarious. Taczanowski gives Batna and Bourief as localities.

154. THE SPOTTED EAGLE *Aquila clanga*, Pallas, is said to winter and to breed sparingly in Algeria.

155. THE TAWNY EAGLE *Aquila rapax* (Temminck), is probably a resident in Algeria. I met

with this species in the mountain forests near Lambessa.

156. THE BOOTED EAGLE *Aquila pennata* (Gmelin), is found in Algeria, but is certainly rare. Taczanowski met with it in the neighbourhood of the Fezzara Lake, and to this locality may now be added Constantine.

157. THE IMPERIAL EAGLE *Aquila mogilnik* (Gmelin), I include in the present list on the authority of Canon Tristram.

158. THE WHITE-SHOULDERED EAGLE *Aquila adalberti*, Brehm, is said to inhabit Algeria, but details of its distribution are meagre.

159. BONELLI'S EAGLE *Aquila fasciatus*, Vieillot, is a resident in Algeria, said by Taczanowski to be common in the mountain districts, and still more frequent in the deserts.

160. THE SHORT-TOED EAGLE *Circæetus gallicus* (Gmelin), was found by Canon Tristram on the plains of Algeria.

161. THE WHITE-TAILED EAGLE *Haliaëtus albicilla* (Linnæus), is a winter visitor to Algeria, but a few pairs are said to breed in the country. Information is much to be desired.

162. THE AFRICAN BUZZARD *Buteo desertorum* (Daudin), is a resident in Algeria. Taczanowski

states that it is common in the mountains near Batna and Constantine. Whether this and the following bird are really distinct from *B. vulgaris* is questionable.

163. THE LONG-LEGGED BUZZARD *Buteo ferox* (Gmelin), is a resident in Algeria, but details of its distribution are wanting.

164. THE COMMON KITE *Milvus regalis* (Brisson), is a widely distributed winter visitor, especially frequenting the Sahara sub-region. It is said to breed sparingly in the Atlas, but the majority migrate northwards again in February and March.

165. THE BLACK KITE *Milvus ater* (Gmelin), is a resident in Algeria and very widely distributed. It was certainly the commonest Raptor seen by me. I met with it in all parts of the country I visited south of Constantine, including the mountains up to 7000 feet elevation, the desert country where scarce a trace of vegetation could be seen, the fertile lands, the oases, and even the large towns, in which it acts the part of scavenger. It is wonderfully bold, seeming to have no fear of man, and would often accompany us for miles, flying just overhead within easy shot.

166. THE BLACK-WINGED KITE *Elanus caeruleus*.

(Desf.), was met with by Taczanowski on the coast between Philippeville and Bonè, in December.

167. THE HONEY BUZZARD *Pernis apivorus* (Linnæus), is a somewhat rare visitor, usually on migration, to Algeria, becoming more abundant in Morocco. Taczanowski met with this species at Constantine, Batna, and Bourief.

168. THE MARSH HARRIER *Circus æruginosus* (Linnæus), is found in Algeria throughout the year, and breeds there, the summer area over-lapping the winter area in this country. It is widely distributed, and I met with it everywhere in marshes and other similar haunts.

169. THE HEN HARRIER *Circus cyaneus* (Linnæus), is a winter visitor to Algeria, and also passes that country on migration to still more southern haunts. Taczanowski states that it is common in the Desert.

170. MONTAGU'S HARRIER *Circus cineraceus* (Montagu), is a winter visitor to Algeria; it is said to be found there all the year round, but whether it breeds I am unable to say.

171. THE GOSHAWK *Astur palumbarius* (Linnæus), is a rare winter visitor to Algeria, but has been said to breed there.

172. THE SPARROW-HAWK *Accipiter nisus* (Lin-

næus), is a rare winter visitor to Algeria, but is said to breed in the country, by Loche.

173. THE PEREGRINE FALCON *Falco peregrinus*, Tunstall, appears to be a winter visitor to Algeria, if rare. It would seem, however, that examples occasionally remain behind and intermarry with *F. barbarus*, producing the intermediate race which has been described as *F. punicus*.

174. THE BARBARY FALCON *Falco barbarus*, Linnaeus, is a resident in Algeria, for the most part confined to the mountain ranges. Taczanowski states that it is the commonest Falcon both in the mountains and the deserts. This species is highly prized by the Arab sheiks for hawking purposes.

175. THE LANNER FALCON *Falco feldeggii*, Schlegel, is a resident in Algeria. Loche remarks that it is more numerous in the southern districts than on the coast.

176. THE SAKER FALCON *Falco sacer*, Gmelin, was met with by Canon Tristram in the southern desert.

177. THE ELEONORA FALCON *Falco eleonoraë*, Gené, is locally distributed. Taczanowski met with it at Jemmapes; and I had the good fortune to witness a most interesting migration of this species at Philippeville on the coast, on the 16th of May.

The bird was assembled in flocks, and I counted as many as ninety on the wing together. They appeared to be hawking for flies, and occasionally chased or toyed with each other in the air. They were by no means shy, and often approached within gun-shot, or perched on the trees under which I was standing. A few birds kept alighting on some haycocks, and even on the newly-ploughed land. The flight is remarkably easy and gliding, resembling that of the Bee-eater. In other respects it resembles that of the Kestrel, but heavier, not so graceful, and apparently performed with more exertion. Sometimes the entire flock was close to the ground, then it would rise until the birds looked no bigger than Swallows. They seemed in no hurry to quit the place, and I saw them still busy after insects as I passed the place again in the evening. Most of the birds were in immature plumage.

178. THE HOBBY *Falco subbuteo*, Linnæus, passes through Algeria on spring and autumn migration to and from its winter quarters in South Africa. I saw an example near Batna in May. Taczanowski states that it is rare.

179. THE MERLIN *Falco æsalon*, Tunstall, is principally known as a winter visitor to Algeria,

but according to Loche a few remain to breed in the mountain districts.

180. THE RED-FOOTED FALCON *Falco vespertinus*, Linnæus, may pass Algeria on migration, but little appears to be known of the circumstance. The assertion by Loche that it breeds in the country is not supported by recent investigation.

181. THE KESTREL *Falco tinnunculus*, Linnæus, is a widely distributed and abundant species in Algeria. It probably undertakes an internal migration towards the Libyan Desert in autumn, for Canon Tristram states that he met with it in the oases and in the dayats; but I, in summer, did not observe it south of El Kantara on the northern borders of the Sahara. It is increased in numbers in winter by migrants from Europe.

182. THE LESSER KESTREL *Falco cenchris*, Naumann, is a summer visitor to Algeria, and breeds sparingly; it is most common on passage from and to its winter quarters in South Africa in spring and autumn. Taczanowski met with it in one locality only.

183. THE EAGLE OWL *Bubo maximus*, Gerini, is a resident in Algeria, where, however, according to Taczanowski, it is rare, and found chiefly in the mountains and forests where it breeds. It may

possibly have been to a great extent confused with the following species.

184. THE EGYPTIAN EAGLE OWL *Bubo ascalaphus*, Savigny, is said by Taczanowski to be very rare in winter, commoner in summer in Algeria. So far as is known, it appears to be more of a north-east African species. Its western limits are not clearly defined. It is included as a bird of Algeria by Canon Tristram.

185. THE LONG-EARED OWL *Asio otus* (Linnæus), is a winter visitor to Algeria, but there is no reliable evidence of its ever breeding in the country.

186. THE SHORT-EARED OWL *Asio accipitrinus* (Pallas), is said by Loche to be very generally distributed, but whether it is only a winter visitor to Algeria, or breeds sparingly in the country, is still undetermined. In Morocco it is said to interbreed with *Asio capensis* (Smith), (a form that ranges from Spain southwards to Natal); whether this latter race visits Algeria is not known.

187. THE SCOPS OWL *Scops giu* (Scopoli), is a resident in Algeria, but increased in numbers in winter by migrants from Europe. It is said that the resident race is slightly smaller. It breeds in holes in trees.

188. THE TAWNY OWL *Strix aluco*, Gerini, is a

resident in Algeria, but somewhat locally distributed. So far as is known, the resident birds belong to the typical race; but there is some evidence to suggest that examples of the paler northern race wander to the country in winter.

189. THE SOUTHERN LITTLE OWL *Athene glaux* (Savigny), is a resident in Algeria, and generally and commonly distributed in all parts of the country. In the oases it is said by Canon Tristram to breed down the sides of the wells when cliffs are wanting. Loche remarks, that examples of this pale race of *Athene noctua* (Scopoli) from the desert are even paler than those from the area of the Tell.

190. THE BARN OWL *Aluco flammeus* (Linnæus), is a common resident in Algeria, but evidently local. Taczanowski states that it is rare in winter.

191. THE ROLLER *Coracias garrulus*, Linnæus, is a summer visitor to Algeria, principally to the mountain forest districts. I met with it very abundantly in the evergreen oak woods and the cedar forests of the Djebel Aurés, but did not see a trace of it in the oases south of the Atlas.

192. THE COMMON KINGFISHER *Alcedo ispida*, Linnæus, is a resident in Algeria, but not common, and locally distributed along suitable streams.

193. THE HOOPOE *Upupa epops*, Linnæus, is a resident in Algeria, but subject to much local movement according to season, and largely increased in numbers, especially in the Sahara sub-region, during winter, by migrants from Europe. It is found throughout the mountain districts in summer, but winters chiefly in the oases. This species is held in superstitious veneration by the Arabs, is consequently very tame, and resorts to the M'zab cities in large numbers. I found it much more wary in the mountain forests and on the bare hillsides, and far more often heard than seen. Its full, hollow note may be heard for a great distance.

194. THE BEE-EATER *Merops apiaster*, Linnæus, is most abundant on spring and autumn migration, to and from its winter quarters in South Africa, but a fair number remain to breed in the country of the Tell. I found it on migration in the oases early in May, and sparingly distributed in the forest country of the Aurés.

195. THE BLUE-CHEEKED BEE-EATER *Merops persicus*, Pallas, appears to visit Algeria in summer. I met with a pair of these birds in the oasis of Biskra, in company with the preceding species, but whether they breed in the country I am unable to say.

196. THE COMMON NIGHTJAR *Caprimulgus europæus*, Linnæus, is most frequent in Algeria during the two seasons of passage, but a few remain to winter, and a few remain to breed in the country. Details of its distribution, either in summer or winter, are wanting.

197. THE RED-NECKED NIGHTJAR *Caprimulgus ruficollis*, Temminck, is probably a resident in Algeria and Tunis, but subject to considerable internal migration, breeding in the northern districts and wintering in the remote oases of the Sahara. This species, away from Algeria, has a very restricted range, so far as is known, being a summer visitor to the southern half of the Spanish Peninsula, and to some of the Canary Islands. A single example has been shot in the north of England.

198. THE COMMON SWIFT *Cypselus apus* (Linnæus), is a summer visitor to Algeria, entirely quitting the country in November. I found it very generally dispersed both in the Tell and the Sahara sub-region, and Canon Tristram remarked its presence as a breeding species still further south.

199. THE PALLID SWIFT *Cypselus apus pallidus*, Shelley, is a summer visitor to Morocco, and is doubtless to be met with in various parts of Algeria.

200. THE WHITE-BELLIED SWIFT *Cypselus melba* (Linnæus), is a summer visitor to Algeria, chiefly confined to the mountain districts. I met with it in some numbers on the cliffs at Constantine, consorting with the preceding species. I also observed it at Batna and El Kantara, but not further south. Canon Tristram states that it breeds on the mosque towers as well as on rocks.

201. THE COMMON CUCKOO *Cuculus canorus*, Linnæus, is best known as passing through Algeria on spring and autumn migration, but a few remain in spring to breed. I found this species pretty generally distributed, most frequent in the cedar forests near Batna.

202. THE CUCKOO *Cuculus*, sp. inc., seen by Canon Tristram near Tuggurt (described by him as "a small African species"), still remains undetermined.

203. THE GREAT SPOTTED CUCKOO *Coccyzus glandarius* (Linnæus), is a summer visitor to Algeria, generally distributed throughout the wooded districts.

204. THE ALGERIAN PIED WOODPECKER *Picus numidicus*, Malherbe, is a resident in the forest districts. It is the representative species of our own Great Spotted Woodpecker (*P. major*), and

is distinguished by the varying amount of scarlet on the breast.

205. THE LESSER SPOTTED WOODPECKER *Picus minor*, Linnæus, is a resident in the forest districts of Algeria. Malherbe sought to separate the Algerian birds under the name of *P. ledouci*, but the characters are apparently too trivial.

206. THE ALGERIAN GREEN WOODPECKER *Gecinurus vaillantii* (Malherbe), is a resident and widely distributed throughout the forest districts, though nowhere particularly common. I only met with this species in the cedar forests west of Batna, and in the evergreen oak woods between Oued Taga and Lambessa.

207. THE WRYNECK *Iynx torquilla*, Linnæus, is locally distributed in Algeria, where it is probably a resident, but many pass through the country on migration after visiting Europe in summer, to winter still further to the south. I met with this species at Biskra in May, and Taczanowski at Philippeville on the coast early in April.

208. IRBY'S RAVEN *Corvus tingitanus*, Irby, is a resident in Algeria, and very widely and commonly distributed. I met with this Raven, the Algerian representative of the Common Raven, everywhere I went south of Constantine, either in pairs or in small

flocks. Canon Tristram also remarks its gregarious habits, and mentions that towards evening at Laghouat he noticed long files of Ravens returning to their roosting-places in the desert. I have reason to believe that this Raven also breeds in colonies.

209. THE HOODED CROW *Corvus cornix*, Linnæus, is a somewhat rare winter visitor to Algeria.

210. THE ROOK *Corvus frugilegus*, Linnæus, is an accidental visitor to Algeria in winter.

211. THE JACKDAW *Corvus monedula*, Linnæus, is a somewhat local but in certain districts a very common resident in Algeria. Canon Tristram remarked its abundance in the rocky gorges of the Sahara sub-region; whilst I found it common in the rocks at Constantine, and less frequent in the cedar forests west of Batna.

212. THE MOORISH MAGPIE *Pica mauritanica*, Malherbe, is a resident, and widely distributed throughout the wooded districts. It is closely allied to the Common Magpie of Europe, distinguished by a large patch of blue skin behind the eye, and by the absence of gray from the rump. Examples, however, from the Alpuxarras mountains in Southern Spain are said to be intermediate between *Pica caudata* and *P. mauritanica*.

213. THE AZURE-WINGED MAGPIE *Cyanopica cooki*, Bonaparte, appears to be a resident in Algeria, but particulars of its distribution are unknown. I saw nothing of this species.

214. THE ALGERIAN BLACK-HEADED JAY, *Garrulus cervicalis*, Bonaparte, is a resident principally confined to the mountain forests.

215. THE CHOUGH *Pyrrhocorax graculus* (Linnæus), is a resident in Algeria, confined to the mountains of the Atlas, and does not appear ever to wander into the oases or south of that rugged range.

216. THE STARLING *Sturnus vulgaris*, Linnæus, is a common winter visitor to Algeria, where it is widely dispersed far to the south of the Atlas. Canon Tristram states that myriads of Starlings visit the date forests and do vast damage amongst the ripe fruit. The Arabs snare this bird in thousands for food.

217. THE BLACK STARLING *Sturnus unicolor*, Marmora, is also a winter visitor to Algeria, but whether it breeds in the country I am unable to say. It is said to consort with the preceding.

218. THE ROSE-COLOURED PASTOR *Pastor roseus* (Linnæus), has occasionally wandered on migration to Algeria.

219. THE ALGERIAN SHORE LARK *Otocoris bilopha*

(Rüppell), is a resident in Algeria, widely yet locally distributed over the desert plains.

220. THE THICK-BILLED LARK *Rhamphocorys clot-bey* (Bonaparte), is supposed to be a resident in the deserts south of the Atlas. Canon Tristram only met with it on the mountains to the south of El Aghouat.

221. THE CALANDRA LARK *Melanocorypha calandra* (Linnæus), is a resident in Algeria, principally if not entirely confined to the cultivated districts, especially of the Hauts Plateaux. Canon Tristram did not observe this species in the extreme south.

222. THE SHORT-TOED LARK *Calandrella brachydactyla* (Leisler), is a resident in Algeria, but its numbers are increased in autumn and winter by migrants from Europe. It would appear to be subject to some local or internal migration, from the Tell region to the desert, for Taczanowski states that it arrived at Biskra in March. Canon Tristram met with it on the Hauts Plateaux.

223. THE LESSER SHORT-TOED LARK *Calandrella minor* (Cabanis), is a small rufous form of *C. pispoletta*, confined to North Africa, Palestine, and Asia Minor. It is a resident in Algeria, and said by Taczanowski to be very common in the desert.

224. THE DESERT LARK *Ammomanes deserti* (Lich-

tenstein), is a resident in the Sahara sub-region. I did not meet with this bird until I reached El Kantara, the entrance to the desert; it was also common at Biskra. Taczanowski states that he first met with it on the southern spurs of the Atlas.

225. THE PALE DESERT LARK *Ammomanes pallida*, Cabanis, according to Canon Tristram, takes the place of the former bird on the southern desert sands. It is probably only a climatic race.

226. THE LITTLE DESERT LARK *Ammomanes regulus* (Bonaparte), is described by Canon Tristram as being very rare, and only found in the Chaamba country and the Touareg deserts (lat. 32°). It is probably only a race of *A. deserti*.

227. GOULD'S DESERT LARK *Ammomanes cinctura*, Gould, is a resident in the deserts of Algeria. It is probably another race of *A. deserti*.

228. THE CRESTED LARK *Galerita cristata magna*, Hume, is a common and widely distributed resident in Algeria north of the deserts. It is the pale form of the Crested Lark, *G. cristata*.

229. THE ISABELLINE CRESTED LARK *Galerita cristata isabellina*, Bonaparte, is a resident in the desert regions of Algeria. It is the most pronounced rufous form of *G. cristata*. Taczanowski states that he met with it principally on the sand-hills.

230. TRISTRAM'S CRESTED LARK *Galerita cristata macrorhyncha*, Tristram, is a resident on the northern borders of the Sahara. Taczanowski met with this race between El Kantara and El Outaia. It is the large-billed race of *G. cristata*, measuring in length of bill from .9 to 1.0 inch.

231. THE CURVE-BILLED LARK *Certhilauda desertorum* (Stanley), is a resident in the deserts, where it is said to be universally if sparingly distributed.

232. DUPONT'S LARK *Certhilauda duponti* (Vieillot), is a resident but very rare, and was only met with by Canon Tristram in the ravines of the Wed N'ca, in the Beni M'zab (lat. 33°).

233. SALVIN'S LARK *Certhilauda duponti salvini*, Tristram, "a smaller and more slender" bird than the preceding, is a resident in the southern and south-eastern deserts.

234. THE SKYLARK *Alauda arvensis*, Linnæus, is a resident in Algeria, principally confined to the region of the Tell. Its numbers are increased by migrants from Europe in winter. I only met with this species in the meadows and barley-fields round Batna.

235. THE WOOD LARK *Alauda arborea*, Linnæus, is a rare resident in Algeria, confined principally to the mountain woodlands. I met with this species

on the hills west of Batna. This species is more abundant in winter.

236. THE CORN BUNTING *Emberiza miliaria*, Linnæus, is a resident in Algeria, fairly well distributed over the region of the Tell. I did not meet with this species south of the Atlas.

237. THE CIRL BUNTING *Emberiza cirhus*, Linnæus, is a local resident in the region of the Tell. Taczanowski states that it is common in the mountain forests.

238. THE ORTOLAN BUNTING *Emberiza hortulana*, Linnæus, is said to be a summer visitor to Algeria, and to breed there in small numbers. Its distribution, however, requires determination.

239. THE HOUSE BUNTING *Emberiza sahare* (Bonaparte), is a resident in Algeria, principally confined to the southern oases. I met with it in the oases of El Kantara and Biskra. It is certainly the tamest bird I ever saw, and frequents the Arab houses without any sign of fear. This is a very variable species. The skins which I obtained have very obscure centres to the feathers on the back; but a skin obtained by Canon Tristram at Berroughuia in December has these dark centres much more developed. It might almost be considered as an intermediate form between *E. sahare*

and *E. striolata*, which ranges from Nubia to India. Taczanowski evidently confused the two species. The habits of both are very similar.

240. THE MEADOW BUNTING *Emberiza cia*, Linnæus, is a resident in Algeria, apparently chiefly confined to the mountain districts. I met with this species in the Djebel Aurés near Wed 'Taga, and in the cedar forests west of Batna.

241. CRETZSCHMAR'S BUNTING *Emberiza cœsia*, Cretzschmar, is a rare visitor to Algeria.

242. THE LITTLE BUNTING *Emberiza pusilla*, Pallas, is a very abnormal migrant to Algeria, only two examples having been obtained in that country.

243. THE REED BUNTING *Emberiza schœniclus*, Linnæus, is a comparatively rare winter visitor to Algeria. Taczanowski only met with this species once.

244. THE BULLFINCH *Pyrrhula vulgaris*, Temminck, occasionally wanders to Algeria in winter.

245. THE TRUMPETER BULLFINCH *Erythrospiza githaginea* (Lichtenstein), is a resident on the steppes and plateaux near the desert. Both Taczanowski and Canon Tristram met with this species.

246. THE CRIMSON-WINGED FINCH *Erythrospiza sanguinea* (Gould), is a rare visitor to Algeria.

247. THE LINNET *Linota cannabina* (Linnæus), is a resident in Algeria, confined probably to the Tell, and breeding on the northern slopes of the Atlas. I met with this species in the Djebel Aurés above Lambessa, where it was very common.

248. THE BRAMBLING *Fringilla montifringilla*, Linnæus, is an occasional winter visitor to Algeria, usually in severe seasons.

249. THE ALGERIAN CHAFFINCH *Fringilla spodiogena*, Bonaparte, is another species peculiar to Algeria (and Morocco), and principally confined to the mountain woodlands. I remarked its general abundance in the Djebel Aurés, especially round Batna and Lambessa. The note of this species is very different from that of the Common Chaffinch, more resembling that of the House Sparrow (*Passer domesticus*). The song too is different. Otherwise the habits of the two species are very similar. The nest is built in just such another situation as that of the English bird. I found a nest of the Algerian Chaffinch scarcely completed on the 12th of May, in the evergreen oak forests. It was built in a small oak, about ten feet from the ground, in a fork, almost buried in the lichen which drapes most of the timber in this region.

It was made of lichens, wool, vegetable down, and a few roots and bents, and lined with the feathers of the Barbary Partridge. It was nothing near so compact as that of the English Chaffinch, but the same remarkable imitation of surrounding objects was noticeable. The hen bird was very anxious at the nest.

The Algerian Chaffinch is represented on the Azores by *Fringilla moreleti*, Madeira by *F. maderensis*, and Canary Islands* by *F. tintillon* and *F. palmæ*, four fairly well-defined races, the three former of which, however, completely intergrade amongst themselves owing probably to interbreeding. The Algerian species may be always distinguished by its pink underparts and green mantle. Dresser asserts that the female of the Algerian species cannot be distinguished from the female of the Common Chaffinch, but this is not correct. It may always be identified by its much grayer tone of colour, by the white outer margins to the secondaries, by the greater amount of white

* I may here take the opportunity of stating, that, owing to the error of a valued correspondent, I was led to include in the addenda to my work, *The Game Birds and Wild Fowl of the British Islands*, what purported to be a new species of *Pratincola* from these islands, but which is really a new form of *Pratincola* or Bush Chat.

on the tail feathers, by its larger bill, and by its generally larger size.

250. THE COMMON CHAFFINCH *Fringilla cœlebs*, Linnæus, is a rare and local resident in Algeria confined to the coast district. I only met with it in the neighbourhood of Philippeville, where it was rather common in the cork woods.

251. THE DESERT ROCK SPARROW *Petronia brachydactyla*, Bonaparte, is a resident in Algeria, but details of its distribution in the desert areas are wanting. I did not meet with this bird.

252. THE ROCK SPARROW *Petronia stulta* (Gmelin), is a resident in Algeria, but by no means common. Its distribution is almost unknown.

253. THE DESERT SPARROW *Passer simplex* (Lichtenstein), is a rare and local resident, only found, according to Canon Tristram, in the Southern Sahara. This naturalist found it breeding at El Wed.

254. THE SPANISH SPARROW *Passer hispaniolensis*, Temminck, is a resident in Algeria, and very widely distributed amongst the towns and villages. I remarked that it was more frequent in the wilderness, away from the habitations of man, than the following species. Its note is precisely similar to that of the Common Sparrow.

255. THE COMMON SPARROW *Passer domesticus* (Linnæus), is a resident in Algeria, and widely distributed throughout the towns and villages.

256. THE TREE SPARROW *Passer montanus* (Linnæus), is a rare resident in Algeria, but its distribution is very imperfectly known.

257. THE HAWFINCH *Coccothraustes vulgaris*, Pallas, is a resident in Algeria, but only sparingly and locally distributed, chiefly in the northern slopes of the Atlas. I met with it in the evergreen oak forests near Lambessa.

258. THE GREENFINCH *Ligurinus chloris* (Linnæus), is a resident in Algeria, its numbers being increased in winter. The resident birds, confined principally to the Tell, have been distinguished under the name of *L. aurantiiventris*, but the characters relied upon—a more brilliant colour and smaller size—appear not to have even a sub-specific value. I found the Greenfinch very common near Constantine.

259. THE SERIN *Serinus hortulanus*, Koch, is a resident in Algeria, but commoner in winter than in summer. It is widely distributed, not only in the mountain districts, but in the more northern oases. I met with it in the oases of El Kantara and Biskra.

260. THE SISKIN *Chrysomitris spinus* (Linnæus), is a very rare and occasional winter visitor to the northern districts of Algeria.

261. THE GOLDFINCH *Carduelis elegans*, Stephenson, is a resident in Algeria, and widely distributed both north and south of the Atlas. I met with it in all parts of the country from the coast to the oases, and up the mountains to an elevation of 4000 feet.

262. THE SWALLOW *Hirundo rustica*, Linnæus, is a common summer visitor to Algeria, and breeds from the Sahara sub-region to the coast. Canon Tristram asserts that a few birds pass the winter in the southern oases, but the majority quit the country in November, returning in February. The natives state that the birds cross the desert to Timbuctoo, "the El Dorado of Arab and Swallow." Canon Tristram, when in the Desert, noticed myriads of Swallows flying north at the beginning of February.

263. THE HOUSE MARTIN *Chelidon urbica* (Linnæus), is a common summer visitor to Algeria, and breeds from the Sahara sub-region to the coast. A few birds winter in the southern oases. I noticed this bird building towards the end of May at Philippeville. Most of the mud was baked hard by the sun, and it was only to be obtained in a

sufficiently soft state in one or two places. In these the Martins literally swarmed, and the mud was nothing but a moving mass of birds. The barracks at Batna contain the most extensive colony of this species that I ever saw.

264. THE SAND MARTIN *Cotyle riparia* (Linnæus), is a summer visitor to Algeria, and is not known to winter in even the remotest of the southern oases. I found it breeding in suitable localities from a little north of El Kantara to the coast.

265. THE CRAG MARTIN *Cotyle rupestris* (Scopoli), is a summer visitor to Algeria, and breeds locally in the mountains. I only met with this species in the stupendous pass of El Kantara—the gate of the Sahara—where it breeds commonly.

266. THE SPOTTED FLYCATCHER *Muscicapa grisola*, Linnæus, is best known as passing through Algeria on spring and autumn migration—when it literally swarms from south to north—but a comparatively small number remain to breed. I met with this species in all parts of the country. It abounded in the oasis of Biskra, and was common in all wooded and cultivated districts.

267. THE PIED FLYCATCHER *Muscicapa atricapilla*, Linnæus, is a resident in Algeria, and widely distributed from the more northern oases to the coast,

and up to 4000 feet in the Djebel Aurés. I met with it very common at Constantine, more sparingly southwards.

268. THE RED-BREASTED FLYCATCHER *Muscicapa parva*, Bechstein, is said by Loche to be found in Algeria. It may be a rare winter visitor.

269. THE WOODCHAT SHRIKE *Lanius rufus*, Brisson, is a summer visitor to Algeria (arriving in March, according to Taczanowski), and widely distributed from the more northern oases to the coast. I met with this species in all parts of the country wherever the vegetation was sufficient to afford it shelter.

270. THE RED-BACKED SHRIKE *Lanius collurio*, Linnæus, is most probably an accidental visitor to Algeria, seeing that it occasionally nests in Portugal, and has been shot in the south of Spain. The normal line of migration of this Shrike is too far to the east to render the bird's appearance in Algeria more than exceptional.

271. THE ALGERIAN GRAY SHRIKE *Lanius algeriensis*, Lesson, is a resident in the country. Taczanowski states that this species is very common on the plains near Fezzara.

272. THE PALLID SHRIKE *Lanius lahtora*, Sykes, is a resident in Algeria, and replaces the preceding

species on the southern spurs of the Atlas and in the desert. Canon Tristram found it very abundant, and a permanent resident in the dayats and oases of the Sahara sub-region.

273. THE HOODED SHRIKE *Telephonus erythrophterus* (Shaw), is said by Taczanowski to be not rare in winter in the forests and shrubberies. It is also said by Loche to be common, and to frequent bushy districts. Its breeding range is not clearly defined.

274. THE GOLDEN ORIOLE *Oriolus galbula* (Linnaeus), is perhaps best known as a winter visitor to Algeria, but a considerable number remain to breed in the country. I met with this species in the oasis of Biskra, less commonly in the mountain forests near Lambessa.

275. THE DUSKY BULBUL *Pycnonotus barbatus* (Desf.), is a resident in Algeria. Taczanowski met with this species universally distributed in the scrub on the mountains.

276. THE MEADOW PIPIT *Anthus pratensis* (Linnaeus), is a winter visitor to Algeria; I am not aware that any individuals remain to breed in the country. I occasionally met with it in swampy places, but never found it nesting.

277. THE RED-THROATED PIPIT *Anthus cervinus* (Pallas), is a rare winter visitor to Algeria. Tac-

zanowski states that he met with this species frequently at the Fezzara Lake.

278. THE TREE PIPIT *Anthus trivialis* (Linnæus), is a winter visitor to Algeria; whether it ever breeds in the country I am unable to say.

279. THE TAWNY PIPIT *Anthus campestris* (Linnæus), is a resident in Algeria, most abundant in winter. It breeds on the northern slopes of the Atlas, and in winter does not appear to go further south than the Hauts Plateaux. It breeds commonly near Batna, more sparingly at Lambessa.

280. RICHARDS' PIPIT *Anthus richardi*, Vieillot, is a very rare abnormal migrant to Algeria.

281. THE WATER PIPIT *Anthus spipoletta* (Linnæus), is a winter visitor to Algeria. I met with it as far south as Biskra, as also did Taczanowski.

282. THE WHITE WAGTAIL *Motacilla alba*, Linnæus, is a common winter visitor to Algeria, a few remaining all through the summer.

283. THE PIED WAGTAIL *Motacilla alba yarrellii*, Gould, occasionally visits Morocco in winter, and there can be little doubt that it wanders into the extreme north-west of Algeria.

284. THE GRAY WAGTAIL *Motacilla sulphurea*, Bechstein, is a winter visitor to Algeria, said by Loche to frequent the mountain streams.

285. THE BLUE-HEADED WAGTAIL *Motacilla flava*, Linnæus, is a winter visitor to Algeria. I met with it in flocks in the oases, apparently on migration, in May; but Taczanowski states that he observed it between Constantine and Batna, much further north, in March.

286. THE COMMON WREN *Troglodytes parvulus*, Koch, is a resident in Algeria. I found it generally distributed throughout the Djebel Aurés. One example I shot is slightly paler than specimens from Europe.

287. THE COMMON CREEPER *Certhia familiaris*, Linnæus, is a resident in Algeria. It frequents the pine and cedar forests. Taczanowski states that it is paler than the Creeper of Europe. I met with this species in the cedar forests west of Batna.

288. THE NUTHATCH *Sitta cæsia*, Wolf, is a resident in Algeria. Whether it differs from typical European examples I am unable to say, never having seen a specimen from the country.

289. THE GREAT TITMOUSE *Parus major*, Linnæus, is a resident in the wooded districts of Algeria north of the Atlas.

290. THE ALGERIAN COAL TITMOUSE *Parus le-douci*, Malherbe, is a resident, and principally confined to the mountain forests. I obtained seven

specimens of this interesting bird, and noticed that it frequents the evergreen oak woods as well as the pine forests. The Crested Titmouse, *Parus cristatus*, may yet be found to inhabit the Algerian or Moroccan forests.

291. THE ALGERIAN BLUE TITMOUSE *Parus ultramarinus*, Bonaparte, is a resident in Algeria, found throughout the forest districts. I met with it in abundance in the evergreen oak and cedar forests; also in the cork woods at Philippeville. It was only just commencing to nest in the middle of May. The birds from the Canaries are distinct, and named *Parus teneriffæ*. These latter are distinguished from the Algerian species by the absence of pale tips to the greater wing coverts, and the very indistinct tips to the innermost secondaries, which in *P. ultramarinus* are broad and conspicuous.

292. THE HEDGE ACCENTOR *Accentor modularis* (Linnæus), is a rare abnormal migrant to Algeria in winter.

293. THE ALGERIAN BUSH-BABBLER *Argya fulva* (Desf.), is a resident in Algeria, apparently south of the Atlas, where it is, according to Taczanowski, found throughout such desert sand-hills as are covered with scrub. I met with this species at Biskra.

294. THE DESERT WREN WARBLER *Drymæca*

striaticiceps, Tristram, is a resident in Algeria in the southern deserts. It was first discovered by Canon Tristram at the salt lake of Ain Bahrdad, near Hadjira.

295. THE FANTAIL WARBLER *Cisticola cursitans* (Frankl.), is a resident in Algeria. Taczanowski met with this species everywhere in the barley fields round the oases. I remarked it common at Biskra.

296. CETTIS WARBLER *Cettia cettii* (Marmora), is a winter visitor to Algeria, and met with from the coast regions to the desert. Canon Tristram observed it in all the marshes about Waregla, N'goussa, and the Wed R'hir.

297. SAVI'S WARBLER *Locustella luscinioides* (Savi), is a winter visitor to Algeria, and has much the same distribution as the preceding species. A comparatively small number remain to breed.

298. THE GRASSHOPPER WARBLER *Locustella locustella* (Latham), is a winter visitor to Algeria, but there can be little doubt that it breeds sparingly in the country.

299. THE SEDGE WARBLER *Acrocephalus phragmitis* (Bechstein), is a winter visitor to Algeria, but as I shot it in the oasis of Biskra in May, a few may probably remain to breed in the country.

300. THE AQUATIC WARBLER *Acrocephalus aqua-*

ticus (Gmelin), is a winter visitor to Algeria, but a few remain to breed. Its distribution in the country is not clearly defined—a statement which applies to most of the species in this sub-family.

301. THE GREAT REED WARBLER *Acrocephalus turdoides* (Meyer), is a winter visitor to Algeria, extending far south into the oases; it is also said to breed in the country.

302. THE REED WARBLER *Acrocephalus arundinaceus* (Brisson), is a winter visitor to Algeria, and passes the country on migration still further to the south. Whether it breeds in the country seems not to be satisfactorily ascertained. The Marsh Warbler, *A. palustris* (Bechstein), may probably yet be found in Algeria, both as a breeding and wintering species.

303. THE MELODIOUS WARBLER *Hypolais polyglotta* (Vieillot), is a winter visitor to Algeria, extending far into the desert oases—Waregla, the Wed R'hir, etc. It also undoubtedly breeds in the country, but its summer area is by no means clearly defined.

304. THE OLIVE-TREE WARBLER *Hypolais olivetorum* (Strickland), is apparently a resident in Algeria. Canon Tristram has taken the nest of this species in the country.

305. THE WESTERN OLIVACEOUS WARBLER *Hypolais opaca* (Lichtenstein), is a resident in Algeria, its numbers being increased in winter. I shot two examples in the oasis of Biskra.

306. THE OLIVACEOUS WARBLER *Hypolais pallida* (Ehrenberg), is a resident in Algeria, resorting in winter to the southern oases.

307. THE RUFOUS WARBLER *Aëdon galactodes* (Temminck), appears to be a resident in Algeria. I only met with this species in the oases of El Kantara and Biskra, where it frequented the Arab gardens, and was very fond of perching on the mud wells and flicking its tail in a very peculiar manner.

308. BONELLI'S WILLOW WARBLER *Phylloscopus bonelli* (Vieillot), is a resident in Algeria, frequenting the mountain forests and the Tell in summer, and retiring to the oases in winter. Its numbers are also increased at the latter season by migrants from Europe.

309. THE WOOD WREN *Phylloscopus sibilatrix* (Bechstein), is a winter visitor to Algeria, but remains to breed in small numbers in the mountain forests of the Atlas.

310. THE WILLOW WREN *Phylloscopus trochilus* (Linnæus), is a very common winter visitor to Algeria, frequenting the oases in enormous numbers.

It is not improbable that a small number remain and breed in the northern districts.

311. THE CHIFFCHAFF *Phylloscopus rufus* (Bechstein), is a winter visitor to Algeria, but there is no evidence of its ever having bred in the country.

312. THE FIRECREST *Regulus ignicapillus* (Temminck), is a resident in the mountain forests of Algeria, its numbers being increased in winter by migrants from Europe. I found it very common near Lambessa and Batna. It is said that the Goldcrest, *R. cristatus* (Koch), visits Algeria in winter, but I cannot find any conclusive evidence of the fact. It is said regularly to pass Malta on migration in spring and autumn.

313. THE DARTFORD WARBLER *Sylvia provincialis* (Gmelin), is a resident in Algeria, but subject apparently to some internal migration, as Canon Tristram remarks, "in winter, in the dayats only."

314. MARMORA'S WARBLER *Sylvia sarda* (Marm.), has once been shot near Batna, according to Taczanowski.

315. THE GARDEN WARBLER *Sylvia hortensis*, Gmelin, is a winter visitor to Algeria, frequenting the oases.

316. THE BLACKCAP *Sylvia atricapilla* (Linnæus),

is a resident in Algeria, breeding in the north and wintering in the oases. Its numbers are increased in autumn by migrants from Europe.

317. THE ORPHEAN WARBLER *Sylvia orphea*, Temminck, is a resident, and breeds in Algeria, its numbers being increased in autumn by migrants from Europe. Its movements locally are much the same as the preceding.

318. THE SARDINIAN WARBLER *Sylvia melanocephala* (Gmelin), is probably a resident in Algeria. Taczanowski describes it as the commonest warbler. I met with it on the coast at Philippeville.

319. THE ALGERIAN WARBLER *Sylvia algeriensis*, Dixon (*Stray Feathers from Many Birds*, p. 104; *Ibis*, 1882, p. 565), is a resident in Algeria, wintering in the oases, and breeding in the wooded districts of the Atlas. For further particulars concerning this intensely interesting species, I would refer the reader to the works above mentioned.

320. THE SPECTACLED WARBLER *Sylvia conspicillata*, Marmora, is a resident in Algeria, its numbers being increased in winter. Canon Tristram remarks of this species—"The common and characteristic Warbler of the country. It resorts to the open grounds, haunting the small bushes and *statices*, living indifferently on the salt marshes, or

on the more exposed and bleak plateaux, but never in the oases or dayats."

321. THE SUB-ALPINE WARBLER *Sylvia subalpina*, Bonelli, is a resident in Algeria, common in winter in the desert, according to Taczanowski.

322. THE LESSER WHITETHROAT *Sylvia curruca* (Linnæus), is a winter visitor to Algeria, frequenting the oases. Whether this species breeds in the country is uncertain, but I observed it as far south as Biskra and sparingly distributed, in May.

323. THE COMMON WHITETHROAT *Sylvia cinerea*, Bechstein, is a winter visitor to Algeria. Whether it breeds or not I cannot say, but I found it, although less common than the preceding species, generally distributed in May, from Biskra northwards.

324. THE NIGHTINGALE *Erithacus lusciniæ* (Linnæus), passes Algeria on spring and autumn migration, a few remaining to breed. I saw one example near Philippeville in May, and another flew on board our steamer as we were crossing the Mediterranean at the end of April.

325. THE EUROPEAN BLUETHROAT *Erithacus cyaneculus* (Wolf), is a winter visitor to Algeria, but details of its distribution there are wanting.

326. THE ROBIN *Erithacus rubecula* (Linnæus),

is a local resident in Algeria, its numbers being largely increased in winter by migrants from Europe. In winter it draws south into the oases.

327. MOUSSIER'S BUSH CHAT *Pratincola moussieri* (Olp-Gall.), is a resident in Algeria, but subject to considerable internal migration according to season. Thus in winter it becomes very rare in the north, increasing in numbers as we go southwards, where, according to Canon Tristram, it is found in every garden and palm-grove, as well as in the thickets of the dayats. In summer it comes up from the more remote oases to breed, especially on the wooded uplands of the Atlas. I noticed that it affected rocky haunts as much as wooded ones.

328. THE STONECHAT *Pratincola rubicola* (Linnæus), is a resident in Algeria, breeding sparingly in the district of the Tell, and visiting the oases in winter, when its numbers are largely increased by migrants from Europe.

329. THE WHINCHAT *Pratincola rubetra* (Linnæus), is a winter visitor to Algeria, frequenting the oases, but there can be little doubt that a small number breed in the Tell, as I noticed it at Batna, Lambessa, and Constantine, in May.

330. THE COMMON REDSTART *Ruticilla phœnicurus* (Linnæus), is a winter visitor to Algeria, but pro-

bably a few remain to breed in the Atlas, as I met with it there in May at an elevation of 4000 feet at Oued Taga. Taczanowski states that it is rare in the mountains.

331. THE BLACK REDSTART *Ruticilla tithys* (Scopoli), is a resident in Algeria, most numerous in winter. The birds that breed in the country resort to the heights of the Atlas for the purpose. I met with it in scattered pairs throughout the Djebel Aurés.

332. THE WHEATEAR *Saxicola oenanthe* (Linnaeus), is a winter visitor to Algeria, but not, according to Canon Tristram, going far to the south. It is said that a few remain to breed at high elevations in the Atlas.

333. SEEBOHM'S CHAT *Saxicola seebohmi*, Dixon (Frontispiece), is a resident in Algeria, but doubtless subject to some local migration from the Atlas to the oases. I discovered this fine species on a small stony plain near Djebel Mahmel, at an elevation of 5,500 feet. It must be exceedingly local—as so many of the Wheatears are in Algeria—as I met with it nowhere else in the country. (Conf. *Ibis*, 1882, p. 563.)

334. THE DESERT WHEATEAR *Saxicola deserti*, Temminck, is a resident in Algeria, and one of the

most widely distributed of the genus in the Sahara sub-region.

335. THE BLACK-THROATED WHEATEAR *Saxicola stapazina* Vieillot, is a resident in Algeria, but increased in numbers in winter by migrants from France and the Spanish Peninsula.

336. THE BLACK-EARED WHEATEAR *Saxicola aurita*, Temminck, is a resident in Algeria. It is somewhat locally distributed south of the Atlas, and I only obtained specimens at El Kantara.

337. TRISTRAM'S CHAT *Saxicola mæsta*, Lichtenstein, is a resident in Algeria. Taczanowski met with this species between Batna and El Kantara.

338. THE PIED CHAT *Saxicola lugens*, Lichtenstein, is a resident in the southern desert regions of Algeria. I only met with this species at Biskra, which is apparently its northern limit, and there it was by no means common. (Conf. *Ibis*, 1882, p. 562.)

339. THE WHITE-RUMPED CHAT *Saxicola leucopyga*, Brehm, is a resident in the deserts of Algeria.

340. THE BLACK CHAT *Saxicola leucura* (Gmelin), is a resident in Algeria. I met with this species north of Batna, also in the mountains to the west of that town. It was also the commonest Chat at El Kantara, where I found a barely finished

nest on the 9th of May. Its note is loud and musical.

341. THE ROCK THRUSH *Monticola saxatilis* (Linnæus), is best known as a migrant in spring and autumn, but a few remain to breed in the rocky ranges of the Atlas. I met with it on Djebel Mahmel in the Aurés.

342. THE BLUE ROCK THRUSH *Monticola cyanus* (Linnæus), is more generally distributed than the Rock Thrush, but very similar remarks apply as to the preceding species. I met with it at high elevations in the Aurés.

343. THE RING OUZEL *Merula torquata* (Linnæus), is a winter visitor to the northern portions of Algeria, the district of the Tell.

344. THE BLACKBIRD *Merula merula* (Linnæus), is a resident in Algeria, most abundant in winter. I met with it in all parts of the country, from the coasts to the mountains, and southwards to the oases of El Kantara and Biskra. I remarked that it did not sing so freely nor so frequently as in more northern lands.

345. THE FIELDFARE *Turdus pilaris* (Linnæus), is a winter visitor to Algeria, but not in any great abundance.

346. THE REDWING *Turdus iliacus*, Linnæus, is a

winter visitor to Algeria, and, as might be expected, from the more delicate constitution of the bird, occurs there in greater numbers than the preceding species.

347. THE SONG THRUSH *Turdus musicus*, Linnaeus, is a winter visitor to Algeria, but I am convinced that it breeds sparingly on the wooded slopes of the Atlas. I met with it in the Djebel Aurés, at Lambessa, and in the cedar forests west of Batna.

348. THE MISSEL THRUSH *Turdus viscivorus*, Linnaeus, is a winter visitor to Algeria, but a small number breed at high elevations in the Atlas. Taczanowski states that it is rare in the mountains.

349. THE DIPPER *Cinclus allicollis* (Vieillot), is a local resident in Algeria, confined to the mountain streams. I believe this Atlas race has been separated under the name of *C. minor* by Canon Tristram, but I have not yet had the pleasure of comparing an Algerian specimen.

It will thus be seen that the list of Algerian birds is both a long and a varied one. As yet we possess but meagre details of the distribution of most of these species; we know little or nothing of that local migration which must take place on a very large scale; we are in ignorance of the nests and eggs of many species, whilst the various species

of Larks, Chats, etc. are most imperfectly defined. There can be no doubt that many new species remain to be discovered, especially in the southern deserts, where the avifauna begins to assume an Ethiopian character, as well as in the mountains of Tunis. It seems to the present writer incredible that so much requires doing in the ornithology of a country so near to our own, and he trusts that this short account of the Birds of Algeria may lead others to study them. I shall be most happy to receive any notes respecting the avifauna of Algeria, or to examine specimens of birds from the country, for it is my intention to work out the species more thoroughly, and possibly to publish a handbook to them.

II.

REPRESENTATIVE SPECIES.

THE almost universal existence of representative species is one of the most remarkable facts elicited by the scientific study of ornithology. The important bearing of this curious phenomenon on the evolution and origin of species is palpable to every student of birds. These representative species may be roughly divided into two very distinct classes. In the first place, they consist of distinct species, obviously very closely allied to each other, and to a parent species; and in the second place, of mere forms or races of variable degrees of distinctness, yet only imperfectly segregated from a parent form. As a general rule, the wider and more extensive the geographical breeding area of a species is, the more that species has become divided into representative races or species, which owe their segregation to the different aspects of climate and the varying conditions of life inevitably correlated with an extensive area of dispersal. It is also a very remarkable fact,

that the most nearly allied races and species are very often inhabitants of the most distant areas, especially in such cases where climatal and geographical conditions in the two extreme points of distribution are almost identical, with a great diversity of such conditions prevailing in the intermediate area. The nearest ally of the Common Jay (*Garrulus glandarius*) is a resident in the south island of Japan (*G. japonicus*); whilst in the intermediate portions of Asia and in Northern Africa the Jays allied to the British species present much greater diversity in their distinguishing characters. The Waxwing (*Ampelis garrulus*) is more distantly related to the Waxwing of Japan (*A. phænicoptera*) than it is to the American Cedar Bird (*A. cedrorum*). The Pied Wagtail (*Motacilla alba yarrellii*) of Western Europe finds its nearest relation in the *M. leucopsis* of Eastern Asia, although it is so closely allied to the White Wagtail (*M. alba*), that instances of its interbreeding with that form have been recorded. The Skylark (*Alauda arvensis*) of Europe is almost identical with the Lark of Japan (*A. japonica*), whilst the Skylark from Siberia (*A. dulcivox*), is characterized by much more pronounced differences. The Common Sandpiper (*Totanus hypoleucus*) is most closely allied to the Spotted Sand-

piper (*T. macularius*) of N. America, so closely resembling it in winter plumage that no character has yet been discovered by which it may be distinguished. Many other instances might be given to illustrate this very interesting fact.

If we look through the list of British birds alone, we shall find that very few of them are without representative forms or species in various other parts of the world, and that in a very considerable number these allies are exceptionally numerous. In confirmation of the rule that the wider the area of dispersal the more variable the species, we may very aptly instance the Peregrine Falcon (*Falco peregrinus*). This bird may be described as practically cosmopolitan, and breeds from the Arctic regions southwards to the tropics and the south temperate zones as far as Patagonia, South Africa, and Australia. It may be very easily imagined that the Peregrine has been and continues to be subject to great differences of climate and to many varied conditions of life throughout such a vast area. The result has been the establishment of many more or less distinct representative forms or races, which preserve a strong general resemblance to the typical or parent species, whilst presenting minor differ-

ences in size and colouration. In South Africa the representative race is *Falco minor*; in North-west India, *F. atriceps*; in South India, *F. peregrinator*; in Australia, *F. melanogenys*; in Patagonia and Chili, *F. cassini*; and in North-west America the very distinct dark race, *F. peali*. These may be mentioned as the most distinct forms of the Peregrine, but several others have been recognized by naturalists. In addition to these facts it is also worthy of remark, that the Peregrine appears to interbreed with *F. barbarus*, in the basin of the Mediterranean, and the offspring have been described as *F. punicus*, although the late Mr. Gurney, the highest authority on the Raptores, assured me that the latter form was really a sub-species of *F. minor*. The Kestrel (*Falco tinnunculus*), the Buzzard (*Buteo vulgaris*), and the Hen Harrier (*Circus cyaneus*), with their respective races, present very similar facts.

We might also, did space permit, give numerous instances from the Passeres, from the Picarian birds, from the Pigeons, the Game Birds, the Waders, the Gulls, and the Ducks, in all of which great natural groups we have wide-ranging species, which have become segregated into various sub-species or representative races. The various slight differences

of colour and even of size which characterize many of these races are primarily due to the influences of climate. It is absolutely impossible to explain or account for them by natural selection. The influence of climate on the resident birds of the Palearctic region alone is perfectly astonishing. In this vast area, which stretches longitudinally from the British Islands to Japan, and latitudinally from the Sahara, Persia, the Himalayas, and China, to the Arctic regions, almost every modification of climate may be found—temperate, arctic, and tropical; pluvial and dry. Where each description of climate reaches its maximum, there we find the most pronounced climatal races, and this quite irrespective of latitude. Thus we find in many cases the most pronounced Arctic forms in Kamtschatka, a country within the same parallels of latitude as the British Islands, but from various physical causes one of the coldest regions in the world. Birds from Siberia, where the climate is uniformly dry, are paler than birds from Western Europe, where the temperature is more humid; individuals from the north of Africa vary considerably from those that inhabit the wet areas of the Himalayas. Thus in the Marsh Titmouse (*Parus palustris*), and its various forms, we find that in

warm pluvial regions the brown in the plumage is intensified; in the dry and sandy areas it is very perceptibly lighter; in the Arctic regions of Siberia it is of variable degrees of paleness, in obedience to intensity of climate; whilst in Kamtschatka it becomes bleached into almost white. All these various forms of Marsh Titmouse insensibly intergrade, probably as much in obedience to the gradual variation of climate as to the interbreeding of individuals. The Hazel Grouse (*Tetrao bonasia*), although not a British species, furnishes such a remarkable instance of colour variation correlated with climate, that I cannot resist describing it. The range of this Grouse is a very extensive one, reaching from Western Europe to the Pacific coasts of Asia and to Japan. The individuals of this species that dwell in the dry Arctic climate of the northern districts are exceptionally gray in colour, whilst those that inhabit the mountains of South Europe, the Amoor valley, and Japan (pluvial climates), are notable for their rufous tints. In the Arctic climate of the north we find the brown has become bleached into gray, whilst the greater rainfall and warmth of the south have intensified it into chestnut.

The modifying influences of climate are also very

forcibly illustrated by certain species and races of Palæarctic Owls. One very remarkable instance is furnished by the Tawny Owl (*Strix aluco*). Its range extends throughout the southern portion of the Palæarctic region, from Scandinavia and North Africa to China. Here again we find almost precisely the same modification of colour in obedience to climate as in the Grouse, but in this case the variation depends to a great extent on the rainfall—the gray examples from areas where the climate is dry, the rich brown examples from areas of excessive moisture, and the intermediate examples from regions of moderate climate. The Short-eared Owl (*Strix brachyotus*), another wide-ranging species subject to great difference of climate, presents us with very similar facts.

It is surprising that the most prominent supporters of Darwin's theory of Natural Selection should attempt to account for these differences in colour presented by so many representative forms by suggesting that they are due to protective causes. It would be impossible to show how a lighter or a darker shade of brown, so finely gradated as to merge insensibly from one extreme to another in a sufficiently large series of individuals, is of the slightest use to the form or race

possessing it, or that it could have been acquired by any selective process. It would, however, be wrong to deny that many species derive inestimable benefit from the colour of their plumage, either by protecting them from enemies, or by rendering them less likely to be seen by their victims whilst in pursuit of their prey. We know how effective the brown plumage of the desert bird is in concealing that species amongst the sand and stones, or how wonderfully protective is the white dress of the Ptarmigan amidst the snow on the mountain tops; but I maintain that we cannot reconcile this particular change of colour, *in its initial stages*, with any selective process, and must attribute it to the fact of those birds dwelling in a climate which has so modified their dress. As soon as the influence of climate began to effect a change of colour in any very specialized manner, and as soon as the colour of the plumage became pronounced enough to be very conspicuous, we can understand how Natural Selection might then exert influence by eliminating all individuals that did not in some special way avail themselves of some method of concealment. Species are gifted with an astonishing amount of power for adapting themselves to surrounding circumstances and to changing con-

ditions of life; so that we cannot doubt that the varied colours resulting from the influence of climate in the first place have been made the best possible use of, and even intensified and elaborated by the stimulating forces of selection. It must, however, be clearly understood that such climatic variation has only been so seized upon by Natural Selection when it has come to be of service to the species, and that in a very great number of cases such variation is at present not of the slightest service, and possibly may never be so. This colour modification by climate removes some of the most serious difficulties and objections to the theory of Protective Resemblance. It disposes of the grave difficulty of demonstrating how a species or race could derive sufficient benefit in the struggle for life from a scarcely perceptible difference in the shade or tint of its plumage, to bring such difference within the scope of Natural Selection. Further, it seems to me that other incipient modifications (not of colour only) may arise in similar ways from a variety of causes entirely unconnected with the vital conditions of existence, and not be influenced in any way by selection until they have become sufficiently pronounced and important to be of use.

It is a matter for surprise that so many eminent ornithologists either decline to recognize the existence or fail to grasp the importance of these various races. Evolutionists should persist in their demand for the full and unqualified recognition of these sub-specific forms, for they illustrate most vividly the segregating forces that are slowly and surely working through the era of present time. Evolution implies the existence of imperfectly segregated forms, or forms and races still undergoing a disintegrating process. Ornithologists cannot ignore them. It behoves, therefore, every student of ornithology to recognize these various races, sub-species, local forms, or by whatever else we may designate them, to the best of his ability and judgment, by a uniform system of trinomial nomenclature. Rather let our literature be burdened with endless trinomials, than suffer the great teachings of nature to be ignored.

We now come to consider another class of representatives, namely, species which are obviously very closely allied, yet perfectly distinct, and inhabiting separate areas. Some of the most interesting instances are those of species inhabiting the Palearctic and Nearctic regions respectively. How

many of our British birds, for example, are represented in the New World by totally distinct yet very closely allied species? To mention only a few, we have the American Goshawk (*Astur atricapillus*), distinguished by its dark head and freckled under-parts; the American Firecrest (*Regulus satrapa*), distinguished by its remarkably small bill and grayish-white lores; the Carolina Crake (*Crex carolina*), distinguished by its black forehead, lores, chin and throat; the American Bald Coot (*Fulica americana*), distinguished by the large amount of white on the under tail coverts; Wilson's Phalarope (*Phalaropus wilsoni*), distinguished by its long slender bill; the American Bar-tailed Godwit (*Limosa fedoa*), distinguished by its chestnut axillaries and under wing coverts; and lastly, the American Woodcock (*Scolopax minor*), distinguished by its attenuated first three primaries and nearly uniform buff under-parts. We might give many other instances, but we will now select a few from other parts of the world. Our well-known Song Thrush is represented in China by *Turdus auritus*, distinguished by its more rounded wings (a result of non-migratory habits), darker tints and greater development of spots on the breast. The Black-bird is represented in the same country by *Merula*

mandarina, a species which is never so pure a black as our own. Our Robin is replaced in Caucasia by *Erithacus hyrcanus*, which is distinguished by its chestnut upper tail coverts; whilst the British Nightingale is replaced in South Sweden, Russia, and Western Asia by *Erithacus philomela*, and in Turkestan and Caucasia by *E. golzii*, both of which differ in important and constant characters. In Algeria our Wheatear is represented by the closely allied *Saxicola seebohmi*, a species specially remarkable for its black throat.

And so we might proceed right through the list of British species, giving instance after instance where our native birds are replaced or represented by perfectly distinct yet closely allied forms. The most important distinction between these representative forms or sub-species, and those entitled to full specific rank, appears to be that the latter have been isolated more completely, or for a longer time, from the typical species than the latter, and have consequently become differentiated. We find that in the case of mere forms or races, interbreeding with the typical forms is taking place, and thus preventing the completion of the segregation; and so soon as this interbreeding is checked by the more effectual isolation of the form and its parent species,

the representative race will advance more or less quickly to the higher dignity of a representative species. The difference between form and species is only one of degree.

There is one more fact which bears very closely on the present subject to which some short allusion must be made, and that is the interesting phenomenon of discontinuous areas of distribution. So far as is known, a broken area of dispersal is excessively rare; for, as we have already seen, discontinuity by the isolation of individuals almost invariably leads to a divergence of character. It is therefore most curious to find the members of a species separated into two or more distinct colonies by vast distances continue to preserve their homogeneity absolutely unchanged. One of the best instances known to the present writer is that of the Fork-tailed Petrel (*Procellaria leachi*). This species breeds on various parts of the coasts of the North Atlantic, from Nova Scotia in the west to the British Islands in the east. It also breeds along the shores of the North Pacific from California to the Aleutian and Kurile Islands and Japan. It will thus be seen that the entire continent of Asia on the one hand and of America on the other separates the two colonies by a vast land mass which we

may safely conclude is an impassable barrier to such an oceanic species.

Several other instances may be given from amongst the birds of prey and the Owls. Thus *Machæramphus anderssoni* is an inhabitant of the west coast of Africa, say from the equator to Damara Land; it is also found in Madagascar, but not in the intervening country so far as is known. The Fish Owl, *Ketupa flavipes*, inhabits the coast districts of China and Northern India. Another instance is furnished by *Asio capensis*, which is found in Morocco, and then again in South Africa; whilst lastly, *Syrnium new-arensense* is, I believe, solely confined to Northern India (*S. indranee* is a small race confined to Southern India), and strangely enough to the island of Formosa, a locality nearly two thousand miles away.

Amongst the Ducks we have as one instance the remarkable distribution of *Dendrocygna fulva*, a bird which inhabits Tropical America from Mexico to Buenos Ayres, and is found in Madagascar and India. This to my mind is also another proof of Antarctic dispersal, and a more continuous land area between S. Africa and India during remote ages.

There are three explanations which might be offered. First, we could assume that in all species whose areas are discontinuous variation may have reached its limits, but this to my mind seems utterly opposed to all the teachings of nature. Secondly, the fact that the individuals in each special locality or area remain homogeneous may be due to their having not been isolated sufficient time for any divergence of character to arise. It is possible that the area of distribution has become discontinuous within recent time, and that provided the same conditions prevail for a long period variation will eventually assert itself, and end in partial or complete segregation. Thirdly, these curious cases are always open to the objection that the species may ultimately be discovered in the intervening area, although in many cases this contingency is certainly a remote, if not an impossible one.

III.

REMARKS ON THE SONG AND NOTES OF BIRDS.

THE songs and call-notes of birds have ever had a fascinating interest for me; the beauty of the former and the variety of the latter are beyond all powers of written expression or description. Of all the sounds uttered by living creatures, the songs of birds are incomparably the sweetest; in many ways the various call-notes, as I hope ultimately to show, are of great utility. The pleasure derived from listening to the sweet music of our native birds is indeed no small one; but when we come to study the philosophy of songs and call-notes, to ponder over the various questions they suggest, the entire subject rises to a higher and even still more fascinating degree of importance. In the present short essay I do not propose to enter very deeply into the strictly philosophical portion of the subject, but rather to dwell on certain well-marked characteristics of the songs of British birds which have received but little attention from ornitholo-

gists, and to allude to one or two points of interest which have been most unaccountably overlooked.

A word as to the origin of Song. I am not a convert to the theory that music or the instinct of song in nature is but the outward expression of the feelings of exuberant internal joy, believing firmly as I do in the universal prevalence of Utilitarian Cause. The more I study the intricate and difficult subject, the more I am convinced that Song originated in Sexual Rivalry, developed and perfected, fostered and increased by that stronger and more assertive vitality which almost without exception is so characteristic of all male birds, including those with any pretensions to musical skill. I am, however, quite prepared to admit that these musical acquirements are employed also to express joy, and are even widely indulged in as a pastime or pleasurable diversion; many species singing the year throughout, save in the moulting season, even when sexual rivalry is dormant. It is a rule *without exception*, that all birds sing their best when inspired by the passion of Love, and that in no known songster does this music show the faintest decline in power at the season when amorous instincts are predominant. It has been said that in those migrants where the males precede the females (and the

custom is almost universal, including all migratory birds of song), the former commence their music *before* the arrival of the latter. So far as the British Islands are concerned, the statement is entirely erroneous, and the songsters are silent until called into voice by the sexual rivalry excited by the appearance of the females. For twenty-five years I have studied bird-life in these islands with unwearying care and incessant application, so that my observations may fairly claim to possess some small amount of weight and importance, and my invariable experience is that Song each season is resumed at the commencement of sexual rivalry, and with one or two exceptions (which it is doubtful if they are exceptions at all, as I hope presently to show) dies completely away with the decline of that sexual stimulus.

To illustrate this I will be content with giving one or two of the most familiar instances. We will take our first series of examples from birds that are resident in the British Islands. One of our earliest birds to regain its song in spring is the Chaffinch. In some districts it may be heard in small numbers during the last ten days of January, as for instance in Devonshire, but further north, in Yorkshire, it is about a fort-

night later. Another early songster is the Yellow Bunting, which in suitable districts commences in February; a third is the Song Thrush, which during mild winters in our southern counties may be heard irregularly through the winter, becoming more persistent in January and February. Now the music of these three species is invariably commenced at the pairing season, and is the result of sexual rivalry. All three birds pair weeks before they commence nest-building; until sexual instincts prompt them into voice all are strictly silent. They continue in song throughout the spring and summer, the Chaffinch and Song Thrush ceasing during the first half of July, and the Yellow Bunting becoming mute during the first fortnight of August, when the breeding season is practically over, and the autumn moult commences. Occasionally a Chaffinch or a Yellow Bunting may be heard in September and October; but I am inclined to believe these individuals are from one cause or another still breeding. I should also point out the significant fact that these birds rear several broods in the course of the season, which in itself is a strong stimulus to the prolongation of song.

Our second series of examples shall be taken

from such species as are regular migrants. First I will instance the Cuckoo, a bird that reaches our islands in April, the males arriving a few days before the females, and the former are invariably silent until stimulated into voice by the appearance of the latter. The Cuckoo has a remarkably short breeding season, and becomes finally silent during the first week or ten days of July, although there is a perceptible decrease in its music numerically during June. The sexual passions in this species are strongest during the last few days of April and throughout May; this is the period therefore of its finest song. As a second instance I may very appropriately mention the Blackcap Warbler. In this species the sexes also migrate singly, the males arriving two or three days before the females. In every case the newly-arrived males are mute, and continue mute, so far as song is concerned, until the females appear, and their arrival is the signal for an outburst of melody which is perfectly astonishing. Never does the Blackcap sing sweeter, more continuously, or with more vital energy, than during the first few weeks of its sojourn in our islands. As this species rears but one brood in the season, the song is not prolonged beyond the first few days of July, and I strongly suspect that

the latest singers are birds whose first nests have been destroyed and their nuptial season abnormally prolonged. As a third instance, I will select the Reed Warbler. This little bird reaches its summer haunts in the British Islands towards the end of April or in the beginning of May; and here again the males are the earliest travellers, preceding the females by a few days. Not a sign of song is heard until the hens do arrive, and then the haunts of this Warbler resound with music. In no species, perhaps, is sexual jealousy more readily expressed in song than in the Reed Warbler. The sight of a rival, or the intrusion of one cock in the particular haunt of another, is the signal for the commencement of a defiant song, and this fact is most evident during the pairing and laying season. Indeed the male often resents human intrusion in a similar manner, commencing to sing the moment his reedy home is invaded by man. All through the love season the Reed Warbler sings most persistently, but the song is not very long continued, only one brood is reared, and the migration south is an early one. I am loth also to pass over the Willow Wren without a few words. Here again the sexes travel by themselves, and the males arrive the first. But not a song

escapes them until love rivalry begins, and silently they may be watched for days skipping about the branches apparently with no sexual instincts whatever. How wonderful is the change, though, as soon as the hens arrive. A burst of passionate song greets their appearance, music indescribably beautiful, which continues from the middle of April until the end of July. The same remarks apply exactly to the Chiffchaff and the Wood Wren.

The third series of examples shall be taken from birds that are resident in our islands, and whose song is more or less perennial. These perennial songs might naturally be thought, to be fatal to our views concerning the universality of love-inspired music. But when we come to study the habits of the species uttering them, we shall find that there is nothing abnormal about them. The three most remarkable perennial songsters are the Robin, the Wren, and the Hedge Accentor. All these birds regain their voice after the autumn moult is over, and their song is particularly charming in the autumn, a season which is not remarkable for nest-building. The explanation is a simple one. From what I have observed during a period of many years, and in widely different localities, I can state with confidence that these birds pair in the

autumn, or, what is more correct, the young birds, and a very large percentage of these autumn and winter singers is composed of individuals reared during the previous spring and summer. Thus, then, we find that the autumn song of birds is inspired by sexual passion after all. The old birds commence to sing later in the season, and continue the concert through the winter until the breeding season, which often commences in favourable years as early as the beginning of February. Not only so, but as the season of reproduction approaches, the music becomes more excited, more prolonged, louder and perceptibly more energetic, as though the singers were urged to greater effort by the quickening sexual instincts within them.

It has been suggested, in a very recent work on Natural History, that certain birds of high musical powers at other times gradually lose their song or suffer it greatly to deteriorate during the breeding season, and our own Robin is given as an instance. I have already explained the meaning of this, but I should like to give another and perhaps still more striking instance of a species losing its song in the nesting season. This is the Missel-Thrush, a bird that sings rapturously during the late autumn and winter months, but drops his lay entirely by the

third week in April, when most other species are overflowing with song. Now the Missel-Thrush begins to pair in the autumn or winter, and sexual instincts inspire the song, these Thrushes congregating for a short period in the former season, when most of the birds begin to pair. It may therefore be laid down as a universal rule, that birds that sing in autumn and winter pair in those seasons. The Hedge Accentor's song is particularly charming about the period of the winter solstice; the birds pair at this date. Sexual rivalry and song are therefore still seen to be inseparable. Birds, however, do not all begin to nest at the same time, so that song is incessant and prolonged over the entire period covered by the nesting of each particular species. It will also be remarked that single brooded birds are the first to become mute, whilst those that rear two or even a succession of broods remain in voice until their season of reproduction is over. The observant naturalist will also find that the songs of birds lose much of their power and persistency after the laying season is over and the more acute stages of sexual strife are passed. The period of song is also a period of battle and great irritation; males sing at each other, chase each other, fight fiercely, and often in their excitement

warble in the air, and become for the moment utterly oblivious to their own safety—actions which are seldom observed after the sexual passions have become less fierce and mating is over. I have watched two rival male Chaffinches singing in concert whilst perched in separate trees; after a little time spent in this musical contest one has flown into the tree containing its rival; burst after burst of song has been uttered, and finally the two birds have flown at each other in fury, and the stronger male has compelled the weaker to beat a retreat—all this happening whilst a female has sat quietly looking on. I have seen Robins get so excited whilst singing that they have been unable to finish their notes, and the song has ended in perfect screams of defiance. In many cases, especially with this species, such contests lead to a battle in which not unfrequently one of the combatants is killed outright or very severely injured. The persistency with which birds will continue to sing when inspired by love is very remarkable. This very winter I noticed a Missel-Thrush perched in one spot for three hours, singing all the time; Sedge Warblers, for instance, seem to sing all the louder and more defiantly if they are irritated. Is it

not therefore reasonably clear that the song of birds originated in sexual rivalry? But a few instances have been given to illustrate and confirm the views I have expressed, but many others could have been named, and I am not aware of one valid exception which could have been quoted in opposition to them.

It scarcely comes within the scope of the present chapter to allude to the various actions of birds which in so many instances accompany song. In some species the habit of soaring largely predominates; witness the song flights of the Pipits, and the aerial wanderings of the Lark. Other species stand motionless to warble their song; others sing whilst hopping up and down amongst the cover. To a great extent the character of the song is influenced by the action or want of action of the bird producing it. The music of birds that sing as they fly is more uneven than in those species that warble whilst at rest, as though the melody were correlated with the motion. In some species song is invariably accompanied by action of the wings, or shaking of the plumage. This is especially remarkable in the Common Starling, and seems to me still further to confirm the hypothesis that song

and sexual instincts are inseparable, this display by the male accompanying the vocal powers in a very striking manner.

It now becomes necessary to glance at another branch of this interesting subject, namely, the variation existing in the song of individuals of the same species. Variation in the songs of birds is almost as palpable as the variation which is so characteristic of bodily structures, of habits, and even of instincts. The subject has received but little attention from naturalists, probably from lack of a musical training or a defective ear. I feel that I have missed much through my lack of musical knowledge, but trust that what little I have been able to gather bearing on the question may serve as an incentive to more elaborate efforts amongst observers whose musical training better fits them for the task. One very remarkable instance of variation of note came under my observation whilst studying the birds of Skye. I found that the Chaffinches which frequented the isolated wooded district of Tallisker had quite a different note from the normal one of this species. Another interesting instance is recorded by Lord Lilford in his very instructive work, *Notes on the Birds of Northamptonshire*. He writes, "We had for some years

in the flower-garden at Lilford a male Redbreast which had somewhere picked up a song entirely unlike his natural sweet but melancholy strain, which he seemed to have entirely lost. I am no musician, and cannot attempt to describe this acquisition; it was loud, short, but not very sweet, and had I not repeatedly seen the bird in the act of giving utterance to it, I should, I think, have attributed it to some escaped foreign Finch or other hard-billed bird." Many times have I heard various well-known and common birds utter snatches of song totally different from their usual melody, and even more frequently have I remarked variations in their notes, which have never been repeated in my hearing. In Algeria I was especially impressed by the remarkable difference between the notes of individuals of various species there and in England. Captain S. G. Reid has remarked, that the Chiffchaffs which are resident in the Canary Islands have acquired a much longer and more desultory song. It may therefore be inferred that there is much less stability in song than is very generally supposed. To my mind *Variation* seems to imply *Selection*, or at least the strong possibility of it, and that the secondary sexual character of song may at least have been en-

couraged and partially developed in certain directions by the exercise of the female bird's choice or partiality.

The entire subject is a very enticing one, and one that I feel convinced would well repay investigation. A careful comparison of the song of individuals of the same species—especially such as are widely distributed—in different areas would probably lead to important results. Another very significant fact is the great difference in the songs of birds very closely allied, as, for instance, between the Willow Wren and the Chiffchaff, the Marsh Warbler and the Reed Warbler, and many others. It would appear that song alone can become a powerful aid to the modification of species. As I remarked in my *Evolution without Natural Selection*—"If certain females are charmed by any peculiarities of plumage or colour in certain males, I can see no reason why the same great law should not apply to vocal sounds as well. If certain females showed preference for certain males possessing a peculiar variation of song, it is easy to conceive how in time slight structural variations which those individuals might present could be preserved, and in time become constant characters through the absence of intercrossing, just as in those species which may

have become modified through certain females showing preference for certain males which displayed any variation of colour that might charm or attract them."

The standard of perfection or excellence in the songs of birds is by no means a uniform or constant one. This is especially remarkable at the period when a species resumes its voice after a long interval of silence, and in the maiden efforts of young individuals. Any moderately observant person may remark innumerable instances of this peculiarity in every singing species. Looking through my note-books, I find many observations recorded, all showing that when the song is regained it is frequently far from perfect. For days the singers seem unable to utter the song complete. In the case of the Chaffinch and the Yellow Bunting, for instance, I have repeatedly remarked that the final notes of the song have been omitted to the extent of ninety per cent.! In many cases for a few days nothing but a series of disconnected twitterings have been uttered by some species, as though the birds were trying to recall their long-lost song. I have remarked the same thing in a Mule Canary after his moult. Many young birds are very indifferent songsters, the art having apparently to be

learnt with considerable effort. Especially is this apparent in the case of young Robins, which sometimes begin to sing before they have quite lost the spotted dress of their youth. Some fully adult individuals of probably every species are much finer songsters than others, the music apparently improving with the age of the bird up to a certain period. I might here remark, that in some few authenticated cases the female has been known to acquire musical powers of high merit; whilst in most others the power of song is confined to a few low twittering notes—which probably represent what was once the best performance of the male at an earlier period in the history of the species, the crude beginning of a song which he has eventually developed into music of bewitching sweetness.

The various call-notes of birds also form a subject of considerable interest. The variety and the very remarkable utility of these notes are readily apparent to every student of living birds. After a lifetime spent in the task of unravelling and mastering the mysteries of avian speech, I confess my utter ignorance of the meaning of an immense and varied assortment of the cries of birds. Some notes are uttered for very obvious reasons, and it is to a

selection of these that my remarks will be principally confined. Perhaps the most interesting sounds uttered by birds are those which may be aptly classed as warning notes—cries that are intended to inspire an enemy with terror, and invariably sounded by weak and defenceless species. One of the most familiar instances occurring to me is the snake-like hissing produced by various species of Titmice and the Wryneck upon being disturbed in their nests. These birds breed in holes, are defenceless creatures, and exposed to an increased disadvantage by being confined in a cavity from which there is no escape. The warning hiss, therefore, must often save them or their eggs from the attacks of mice or other predaceous creatures, which have an instinctive dread of snakes. Another instance is furnished by the Song Thrush and the Missel-Thrush. The former species is by no means a pugnacious bird, but when its young are threatened it flies to and fro, uttering a harsh, grating cry, which is apt to mislead an enemy and inspire it with fear. The Missel-Thrush is, however, a pugnacious species, able to drive off any small enemy, but there can be no doubt that its exceedingly rasping notes are uttered to increase the sense of dread, and render the bird more

imposing and powerful than it really is. Many other defenceless birds utter loud harsh screams and cries when their eggs or young are menaced, for precisely similar reasons.

Then we have to consider another very distinct class of notes, namely, the various cries uttered by birds during migration, which serve the vitally important purpose of keeping the members of a flock together, and of crying the route to the less experienced travellers. Another class of notes, and which must be placed in quite a different category, is that which includes the many varied sounds which serve as a means of recognition, not only between the sexes, but amongst all the individuals of a species. The more difficult this recognition is, owing to the habits of various species, the more startling, striking, or sonorous do the notes become. Thus nocturnal birds almost invariably utter exceptionally loud and piercing or very peculiar notes, which undoubtedly serve the useful purpose of indicating the whereabouts of these birds to their mates or to other individuals of the same species. Witness the loud cries of the Owls, the shrill notes of various Plovers and Waders, the harsh quack of the Ducks, the screams of the Divers, the twanging sounds of the Waterhen, the booming of the

Bittern, and the signals of the Goatsucker. Again, we find those birds that haunt dense thickets and other close vegetation utter very clear and metallic call-notes. We may mention the sharp note of the Blackcap or the Whitethroat, resembling the striking of two pebbles together, which instantly conveys the bird's whereabouts to its mate or companions, when the keenest powers of vision would fail to do so. Nor must we fail to mention the various distinct notes which are peculiar to one sex alone, usually the male, which serve to indicate his presence to the female; the special cries of triumph which so often celebrate the victory over a rival; or the very distinct note which conveys the approach of danger to the gathered flock, and which is often well understood by many stranger species, which profit by the warning cry. What I wish to impress upon the reader is the fact, the very obvious fact, that all these varied notes have been undoubtedly produced, intensified, and differentiated through the subtle action of natural selection; they are beneficial acquirements, in some cases of absolutely vital importance to a species. That they have also suffered much modification by the isolation of individual birds I am also bound to believe, although the data bearing on this part of the question is so utterly

meagre that no general deductions can yet be made from them. Perhaps these few remarks, scattered like a handful of seed by the wayside, may succeed in bearing some fruit by inducing students to pay more attention to the subject than has hitherto been the case.

IV.

THE CUCKOO AND HIS KINDRED.

THE Common Cuckoo (*Cuculus canorus*) of our English woods and fields is the typical species of a group of birds which possess an exceptional interest for the ornithologist. The birds contained in the genus *Cuculus* of Linnæus number some thirty five or forty species, and form an important group in the well-defined family CUCULIDÆ. Naturalists are still much divided in their opinions concerning the affinities of the Cuckoo, but most authorities agree that the MUSOPHAGIDÆ (or Plantain-eaters), a group of African birds, are their nearest surviving relations. With respect to their more distant affinities systematists are far less unanimous. By some they are associated with the Woodpeckers, Rollers, Kingfishers, and other Picarian groups; by others with certain of the Game Birds and with the Rails. They have recently been associated with the Passeres in company with the Pigeons. That they are by no means distantly related to the Galliformes

seems probable, although similar conditions of life may account in some measure for a similarity in external appearance between some of the Ground Cuckoos and certain Game Birds. The number of species and sub-species in the family CUCULIDÆ is doubtless little short of two hundred ; and these are distributed pretty generally over the great land-regions of the globe with the exception of the Polar areas. The great diversity of their appearance is most remarkable, some species closely resembling certain Game Birds in colouration ; others are decked in the most brilliant hues, often of a lovely bronze or metallic character. The range in size is little less remarkable. The one constant external character is the zygodactyle foot (two toes in front, two behind, like that of a Woodpecker) ; it is not known, however, whether any of the Cuckoos are climbers, certainly so far as the typical Cuckoos are concerned the feet are never used for such a purpose. It seems probable that the peculiar form of the Cuckoo's foot is either an inheritance from a common ancestor, or, like so many other peculiarities of structure, continues to be retained after its service for some special function has ceased. The serrated claw of the Goatsucker and the Heron may be similarly explained. The general shape of the

bill is also very uniform throughout the Cuckoo family, and appears to indicate little divergence of habit amongst the species in the manner of obtaining food.

So far as the group of birds is concerned of which the British Cuckoo is typical, the colours of the plumage are neither very conspicuous nor very gorgeous, but the variation between the young and adult stages is both very marked and complicated. In the adults grays of various shades characterize the upper parts; on the under parts white predominates. The young are more strikingly coloured, rich brown, buff, and chestnut predominating. These Cuckoos are remarkable for their long and slightly rounded wings, long graduated tail, and short tarsi, which render their movements on the ground laboured and awkward. The difference of colour between the sexes when adult is never very pronounced, and is usually slight. The species in the genus *Cuculus* are confined entirely to the Old World, where they are practically met with in every portion with the exception of the Arctic regions. Our common Cuckoo is the only species that visits Europe. With the exception of *Cuculus canorus*, the economy of these Cuckoos is but little known. Migratory habits largely preponderate; indeed these

birds are popularly associated almost as closely with seasonal movement as the Swallows. For the most part the haunts of the Cuckoos are arboreal ones, and their food is almost entirely of an insectivorous character. None of the Cuckoos possess any musical powers, their notes being deep-toned and resonant, but some are much more discordant than others. The Cuckoos are comparatively weak and defenceless birds, and are a remarkably good instance of Mimicry in nature—of one species copying another in appearance for the sake of enjoying immunity from enemies! The Cuckoos (*Cuculus*) have cleverly imitated certain Hawks in appearance, and there can be no question that this resemblance, by deceiving predaceous birds, is an enormous advantage. The adult Cuckoo of Europe is remarkably like a Sparrow-Hawk; whilst the young bear just as striking a resemblance to the Kestrel! I am of opinion, that in cases where Cuckoos resemble Game Birds in habits and appearance Mimicry has been again adopted. This is especially noticeable amongst species in the genera *Centropus* and *Carpococcyx*. Another very remarkable instance is the wonderful resemblance of an Indian Cuckoo (*Surniculus lugubris*) to the King Crow (*Dicrurus ater*).

In their mode of reproduction many of the Cuckoos are profoundly interesting. Some of the species (such as the Ground Cuckoos, and the members of the American genus *Coccyzus*) in this family provide for and bring up their young in the usual way—by building nests, incubating their own eggs, and tending their offspring until they can forage for themselves. The species in some of the other genera are, however, confirmed Parasites—birds with no parental instincts, who deposit their eggs in the nests of widely different species, and leave their offspring to be reared by foster-parents. So far as is known the Cuckoos are, with one exception, the only birds with parasitic instincts. This exception is to be found amongst the ICTERIDÆ or American Orioles, the species in the genus *Molothrus* (of which the well-known Cow Bird, *M. pecoris*, is an example), for instance, being parasitical. These Orioles are Passerine birds, and, it need scarcely be said, only very distantly related to the Cuckoos. The origin of this degraded habit in two such very distinct groups is still shrouded in mystery; that it is a very ancient and deeply-rooted habit seems proved, or at least very strongly confirmed, by the fact that the various and complicated conditions which insure its efficiency are so wonderfully and beautifully

perfect—the pairing habits of the birds, the colour and size of the eggs, the periods of their production, and the method of insertion in the selected nest, all having been obviously modified to correlate with the parasitic propensity. I shall have occasion to allude to the habit in greater detail later on, when that portion of the economy of the European Cuckoo is being discussed.

The habits of the Cuckoos are little known, and I may say still less understood. Those of the European species have been most studied, and few birds have been more written about. By far the greater portion of this voluminous Cuckoo literature is the veriest twaddle, and far too much is hypothetical if not absolutely imaginative. No other British species is more puzzling in its economy owing to the many difficult and obscure questions which are involved in a study of its life and habits. I offer the following few remarks as a contribution to the history of this exceptionally interesting bird.

Throughout its wide area of distribution the Cuckoo is a migratory bird. The breeding area of this Cuckoo may be described as the entire Palæ-arctic region as far north as the limit of forest growth. The bird breeds throughout continental Europe, including the British Archipelago, and the

principal islands in the Mediterranean; but it is only an abnormal visitor to the Faroes, to the Canaries, and to Madeira. It is chiefly known in North Africa as passing on spring and autumn migration, but breeds sparingly in Algeria. Passing on to Asia, we find that it occurs in summer in Palestine, Asia Minor, Persia, Afghanistan, Turkestan, Siberia, the Himalayas, Mongolia, China, and Japan. The birds that breed in Europe winter throughout South Africa; those that breed in Asia retire southwards in autumn to India, Ceylon, the Burmese Peninsula, Celebes, and the Philippines. The Cuckoo has several near allies, from which it is possibly only superficially distinct. What we may describe as an Eastern race is *Cuculus himalayanus*, a bird that breeds from the valley of the Yenesay eastwards across Siberia, Mongolia, and China to Japan, and southwards to the Himalayas. The migrations of this race trend to the south and east, and the bird winters in the Burmese Peninsula, throughout the Malay Archipelago, New Guinea, and Australia. Intermediate forms between *C. himalayanus* and *C. capensis* (the South African representative form of the Cuckoo) have been obtained in South Africa; whilst the typical Himalayan form has been shot in Madagascar. This

seems to suggest a migration from India to South Africa across the Indian Ocean, a route which is now but little followed (Conf. *Migration of Birds*, pp. 100, 121). On the other hand, our Cuckoo would appear to interbreed with *C. capensis*, as intermediate forms have been obtained in North-west Africa. This fact is a very interesting ones and seems to suggest that the Palæarctic Cuckoo occasionally breeds in its South African winter quarters. The Himalayan Cuckoo is only known to differ from *C. canorus* in being a trifle smaller. The measurements, however, completely intergrade, so that large examples of *C. himalayanus* are indistinguishable from small examples of *C. canorus*. The note of the two races is entirely different, that of the Himalayan Cuckoo being single and very guttural—a peculiarity which prompted Swinhoe to bestow the name of *C. monosyllabicus* upon this Eastern race. The South African Cuckoo (*C. capensis*) is distinguished by its chestnut upper breast. That *C. canorus* interbreeds with *C. himalayanus* seems extremely probable.

The northern or spring migration of the Cuckoo begins in March and continues until the first or second week in June. Towards the end of March the birds have reached the basin of the Mediterra-

nean; a fortnight later they arrive in the southern portions of the British Islands, and thence gradually spread northwards. The males precede the females by a few days, and in autumn the bulk of the old birds appear to migrate south before the young, which is contrary to the usual rule of flight. The Cuckoo is an early autumn migrant, passing south in August, the young following a few weeks later. I have remarked a certain amount of gregariousness during migration, especially in spring. As is well known, the Great Spotted Cuckoo (*Coccyzus glandarius*) habitually migrates in flocks. In the British Archipelago the Cuckoo may be met with in almost every variety of haunt, in well-wooded localities, on bare open downs, in the fields, on the moors, and even near the summits of our mountains. Few birds seem less confined to any particular class of country than the Cuckoo. Probably its food is readily obtained in any district. A few days after their arrival the males begin to call, and continue in song for a period of about two months. It is quite unnecessary to describe the full, rich double-note of the Cuckoo, but it may be remarked, that the song becomes much less clear, and is often prolonged into three syllables, as the period of its cessation draws near. The Cuckoo is

a most pertinacious singer, and will continue for a long time in one spot if left undisturbed, uttering its notes at intervals. The song is entirely confined to the male bird, the note of the female being a very peculiar, bubbling cry, impossible to express in syllables. I may remark, that very exceptionally the song of the male is uttered in three syllables in spring; but I have always remarked that it is the last syllable which is repeated, and not the first as in summer. This song is occasionally uttered as the bird flies from place to place, and generally when just about to alight:

“The cuckoo is a merry bird,
He sings as he flies.”

The song often begins before sunrise, and is frequently continued well into the dusk. The Cuckoo also utters a low, chattering cry, which is common to both sexes, and is heard most frequently when the birds are under excitement. Many years ago I first remarked the peculiar attraction which the Cuckoo's song possesses for various other birds. I have frequently seen a passing bird turn entirely from its course and alight near to where a Cuckoo was singing. Small birds repeatedly follow a Cuckoo from place to place, whether from dread of its visits

to their nests, from curiosity, or angry irritation, it is impossible to say.

With regard to the pairing habits of the Cuckoo we know next to nothing, but it is interesting to remark that this errant bird, unsettled wanderer as it is, is presumed to have some sort of affection for its summer haunts, and to return season after season to certain particular spots. This affection for locality is very strongly developed in most birds of regular migration, the old nesting-place perhaps being the most potent attraction. This instinct is said to be strong in the Cuckoo, parasitic as the bird is, and is probably the only surviving portion of those parental feelings which have been suffered to lapse for so long and indefinite a period of time. So far as my own opinion goes, and it is supported by the careful observations of many years, I should say that the Cuckoo is neither polygamous nor polyandrous, but pairs annually, and remains in pairs until the usual number of eggs is deposited. So far as polygamy is concerned, there seems to me not a particle of evidence to support it; and as for polyandry, I deny altogether that any excess of males over females can be noted. The male is the noisy bird, drawing attention to himself all the spring and early summer; the female is

songless, and in nine cases out of ten is overlooked altogether. I have several times remarked the presence of a pair of Cuckoos in a certain locality for weeks together, and I have many notes referring to this species where a male and female were in company. The fact is specially noticeable in open, treeless districts and near the moors, where cover is scarce: here half-a-dozen separate pairs of Cuckoos may be met with in the course of a morning.

From the pairing instincts of the Cuckoo we naturally pass to the bird's parasitic habits. Many more or less plausible theories have been propounded to explain this wonderful instinct, yet we are probably as far off as ever in our attempts to elucidate it. The habit may be an inherited one from some ancestral form; it may have been acquired under totally different conditions of life from those with which these parasitical Cuckoos are now surrounded; parasitism may have widely prevailed among birds in earlier epochs; so that all attempts to explain it by present facts, or to harmonize it with now prevailing circumstances, may be futile. It may prove of interest to the student to review a few of the most plausible theories on the subject. First, it has been suggested that the Cuckoo migrates south too early to permit

it to rear its own young; but there can be little doubt that this early passage to its winter quarters is a *result* and not a *cause* of parasitic instincts. The Cuckoo having no family ties is at liberty to migrate as early as it may choose; not only so, but there are numbers of parasitic species that either do not migrate at all, or whose periodical movements are but trifling in comparison with those of the European species. Secondly, it is affirmed—and I think the theory was first mooted by Dr. E. Baldamus, who has perhaps studied the intricate Cuckoo question more assiduously than any other naturalist,—that the Cuckoo is a parasite because its eggs are produced only at long intervals, so that one general incubation would be impossible. Here, again, it seems far more probable that the intermittent development of the eggs is a result rather than a cause of parasitism; whilst it has been suggested that this slow rate of laying is an acquired habit (possibly through natural selection), enabling the mother bird to have sufficient time to find a suitable nest in the interval between each egg. Thirdly, some writers have suggested that the alleged gluttony of the *male* Cuckoo is the reason for the slow development of the eggs, his sexual instincts being subordinated to his abnormal

desire for food, causing him to neglect the female, who is said to be compelled to wander far and wide to insure the fertilization of her eggs! The theory of gluttony is untenable, illogical, absurd. For instance, if the male be a glutton, and so voracious as to neglect even the sexual passion—one of the strongest passions throughout organic life—why is not the female equally so? Again, the very fact that the male Cuckoo has a peculiar cry or love song, and which he is most pertinacious in uttering—as an invitation to the female he is said so sadly to ignore—is a most convincing proof that his sexual instincts are by no means dormant nor sluggish ones. It appears to the present writer that the theory was invented to explain the assumed preponderance of males over females, by suggesting that the latter were the prepotent sex, and as a result of such unequally balanced sexual instincts, according to a well-known natural law, the male offspring are more numerous than the female offspring. That the Cuckoo is a voracious feeder is tolerably well known to most naturalists, its food being quickly digested, but both sexes are equally ravenous. I am disposed, however, to regard this voracity in the young bird as a fact of much greater significance.

Now I think it is a pretty general rule throughout the entire class Aves, that the number of young is regulated to a very important extent by the amount of food available and the degree of difficulty in obtaining it. We find that the birds which produce the greatest number of offspring are the various species of Game Birds and the Ducks. The young of these birds are reared without any great exertion on the part of the parents, indeed the chicks are able in a great measure to feed themselves. It would be a difficult if not an impossible task for a Duck or a Pheasant to bring up a score of chicks, if each individual required as much attention and personally administered nourishment as a young Eagle or a young Robin, for instance. On the other hand, a Petrel, a Guillemot, and a Puffin rear only one chick at a time; a Pigeon, an Eagle, or a Nightjar produce only two chicks for a brood; the conditions under which their young are reared being such that a greater number of nestlings would run serious risks of starvation, either owing to the scarcity or precariousness of the food supply (notably in such species as the Raptors), the difficulty involved in conveying that food to the nest, and, most important fact of all, the voracity of

the young birds themselves, especially such species as Nightjars, Pigeons, Petrels, Gannets, and Puffins. Of course many apparent exceptions may promptly suggest themselves to the reader, but we must be very careful in treating them as exceptions when we bear in mind how little we really know of the subject of the delicate and assuredly certain relation of Food to Reproduction. What may appear difficulties and exceptions might really support our case if the facts and conditions were more clearly understood, or we had a more thorough knowledge of them. It therefore seems not altogether improbable that the above-mentioned facts bear very closely on the curious phenomenon of parasitism amongst the Cuckoos. The young of the European Cuckoo is notoriously voracious; its food is of a kind that is not readily obtainable, namely, caterpillars and insects, each individual one usually having to be sought for and conveyed to the nest singly. It is obvious, therefore, that the parent Cuckoos would find the task of rearing from five to eight nestlings a difficult if not impossible one, and that they have gradually acquired the habit of distributing the labour of rearing each young bird amongst such species as are best able to bring it to maturity. We might reasonably presume that a

Cuckoo, or what is more probable, a common ancestral form, labouring under the great disadvantages of rearing from five to eight voracious young, chanced to desert all or a portion of them, most likely when they had left the nest, and that they were adopted by other species. It is a well-known fact, of which many instances might be given, that various birds evince a strong desire to play the part of foster-parent to deserted, helpless nestlings. The Cuckoo would soon seize upon the obvious advantage, and acquire the habit of regularly leaving all or some of its offspring each season to be thus befriended by other species. There would also be a strong tendency in the offspring to consort with the species that had played the part of foster-parent to them, and probably to lay their eggs in nests belonging to that species. The habit might thus have gradually developed into actual and complete parasitism, the Cuckoo's parental instincts gradually getting weaker and weaker, until nest-building and incubation, by the sure yet subtle working of natural selection, were finally dispensed with, and the eggs invariably dropped into alien nests. Of course it may be suggested, that if the Petrel or the Gannet, for instance, only rear a single nestling, there is nothing to prevent the

Cuckoo from having acquired a similar habit—especially if the voraciousness of the young is a dominating cause. But conditions of life when the habit was first developed in the Gannet and other small brooded birds may have been utterly different from any to which the parasitic Cuckoos or their common ancestors were subjected, causing divergence of habit in two utterly dissimilar directions, and that many influences might have affected one species that did not reach the other. That the Cuckoo still continues to produce from five to eight eggs each season is a most convincing proof of this.

We now pass to the question of the development of the choice exercised in the selection of a foster-parent—a choice so perfect that the young of the Cuckoo are brought to maturity just as successfully as though the actual parents performed the task. The present wonderful perfection of this choice of species appears to me to be the result of many accumulated experiences, preserved by a long and incessant process of natural selection, and by hereditary transmission. It is more than possible that the habit of parasitism arose in the first place through the young rather than through the parent, and that the selection of the nest is due more to

the fact of the young bird's tendency to seek the companionship, the haunts, and the nests of such species as brought it to maturity, or befriended it in the time of its desertion and helplessness, rather than to the chance laying of an egg in some alien nest by an adult bird. The great variety in the colour of the eggs of the European Cuckoo, for instance, appears to me to confirm this view of the question in no uncertain way. The colour of all birds' eggs is hereditary, not only the general colouration, but to a great extent the details and individual peculiarities. The eggs of the Cuckoo vary considerably so far as concerns the species, but only slightly, so far as we can ascertain, as concerns individual peculiarities; and to a remarkable extent these various types of eggs are dropped into nests of such species whose eggs most nearly resemble them in colour. Now the tendency of the young Cuckoo being to make use of the nest of the species in which it was itself reared, we can understand how certain types of eggs were gradually evolved and preserved in this species, and how those certain types have become more or less constantly deposited in nests containing eggs resembling them in colour. This is further confirmed by the fact, that in certain districts there is

a perceptible tendency among Cuckoos to use the nest of certain species. Where the egg has been obviously placed in a wrong nest, either as regards species or colour of the egg, it may be safely assumed that the parent Cuckoo, in danger of immediate delivery, has been compelled to use the first nest obtainable, or has been unsuccessful in finding a nest of the species to which individually it is most closely attached. The choice normally is comparatively a narrow one, and confined to such exclusively insectivorous species as the MOTACILLIDÆ, to the Sylviinæ, the Redstarts, and the Hedge Accentor. Many other species have been known to be selected, even amongst the FRINGILLIDÆ, and more exceptionally a Crow, a Shrike, a Grebe, or a Pigeon. It is a most significant fact, that the eggs of the Great Spotted Cuckoo (an equally parasitic species) are subject to remarkably little variation, very closely resembling those of the Common Magpie in appearance, and that the foster-parents are generally Crows of some kind. The eggs in this group are very uniform in colour, hence we find a corresponding small variation in the tint of those of the parasite Cuckoo which are hatched amongst them.

Another very curious instinct of the Cuckoo

must not be overlooked, and that is the peculiar one in the young bird of ejecting its fellow nestlings. From various reasons the young Cuckoo has an advantage over its companions from its birth. In the first place, it is their superior in size and strength; secondly, it grows quicker and thrives better, probably because it monopolizes the lion's share of the food, so that in about a week after it is hatched it is said to throw out of the nest the legitimate tenants, and to gain the undivided attention of its foster-parents. I am of opinion that the other young birds are in nine cases out of ten killed either by suffocation or starvation before they are thus expelled; and it is not improbable that the old birds in many if not in all cases eject the dead nestlings themselves, as they often do under perfectly normal circumstances. I am well aware that self-preservation is a strong passion in all living creatures, and that such an instinct of ejection may exist in the young Cuckoo, but we know next to nothing about the circumstances, and the evidence bearing thereon is of such a vague character that no cautious student is justified in accepting it without a certain amount of incredulity. It is astonishing that so little has been observed of this portion of the Cuckoo's economy, and still

more astonishing that what little has been noticed or surmised is so widely accepted as unquestionable fact.

A word on the changes of plumage in the European Cuckoo will bring my few fugitive observations on a most interesting species to a close. I am not aware that these changes of plumage had ever been correctly described, or were at all clearly understood, until Mr. Seebohm and myself worked out the subject from a great number of specimens some ten years ago. There is no difference in colour between the adults of both sexes, this final stage of plumage being reached when the bird is not quite two years old. In this adult plumage the upper parts are slate-gray, suffused with brown on the wings, and becoming nearly black on the tail; the quills are barred with white on the inner webs, and the tail feathers are tipped with white, and show more or less obscure traces of white bars least conspicuous on the central feathers; the under parts are grayish-white, darkest on the throat, and barred with dusky-brown below the breast. The bill is black, paler at the base, and with yellow edges; the orbits, irides, legs and feet are yellow. The young in first plumage have the feathers of the upper parts barred with

chestnut-brown and tipped with white, the males not being so rufous on the rump, upper tail coverts, and tail as the females, and the white tips are purer and more clearly defined. This plumage is carried until the following spring, when sexual differences become still more marked, the males losing all traces of chestnut, but retaining the white tips; in the females, however, the chestnut becomes more brilliant, but the white tips are lost. After the next autumn moult but few traces of immaturity are to be seen, and these much more pronounced in females than in males; whilst after the following spring moult the adult stage is reached. It might here be remarked, that the Cuckoo moults twice in the year. The *Cuculus hepaticus* of Latham is the female Cuckoo in the rich liver-brown or "hepatic" stage of plumage assumed after the first spring moult. The reason birds in this stage are so rarely obtained in the British Islands is, that they do not breed in this plumage, and only exceptionally migrate so far north. It has been said that males also assume this hepatic phase, but after careful examination of a great number of specimens, I flatly contradict the statement.

V.

THE BASS ROCK AND ITS BIRDS.

IT has been my good fortune to visit the Bass Rock repeatedly in quest of ornithological knowledge during the past twelve years, and I can safely say that each time my interest has increased. The Bass is one of the best situations for studying the habits of certain sea-fowl in our islands, all the more so because it is, comparatively speaking, easily accessible. You may journey all the way to St. Kilda and find that the economy of the Gannet may be much more readily studied at the Bass. As I am repeatedly asked by unknown correspondents for information concerning the best means of reaching and the proper time for visiting the Bass, a few lines on that subject may doubtless prove useful to the reader who may be tempted to follow in the writer's footsteps, and see the famous Rock for himself. Perhaps the best time for a visit is towards the end of May or early in June, especially if eggs are required; but if the wonderful

sight presented by the young birds is a greater temptation, then the trip should be postponed until July or early August. The town of North Berwick, easily reached by rail from Edinburgh or the south, should be made the base of operations. Three miles from Berwick, along the shores of the Forth, is Canty Bay, and here at the little inn nestling at the bottom of the steep grassy downs the tenant who rents the Bass resides. Boats are usually in readiness to carry visitors across the two miles of sea which separate the Bass from the mainland; but if it should chance that the tenant is already away on the rock a signal is made—by spreading a white table-cloth on the hill-side—which soon results in his return. It might here be remarked, that the Bass is a jealously guarded private property, and that the birds thereon are kept literally under lock and key free from the molestation of trespassers. The tenant—the host of the Canty Bay inn—looks to make a considerable portion of his rent from the eggs and young birds, and also from the rabbits which overrun the rock. There is only one safe landing-place on the Bass, on the southern side where the cliffs fall to the water's edge in a series of downs. Here the ruins of an old fortress have been utilized to protect the rock from the visits of

poaching fishermen, and at the top of the broken grass-grown steps a rough door has been placed, which is kept carefully locked. No other way on to the Bass is possible, except by scaling the cliffs. Years ago the rock was used as a prison, and it is said that many illustrious captives were confined thereon.

Just as at St. Kilda, my first impressions of the Bass were most disappointing. Many birds may be seen with a good glass from Canty Bay, but as the boat chafes and bumps against the rocky landing-place—in a little creek which terminates in a cave frequented by Shags—no one without a previous knowledge of the place would dream that such a vast and wonderful bird colony was so close at hand. The Bass slopes to the south and east, but on the north, north-east, and west falls in more or less broken precipices to the sea, hence but few birds are visible until the edge of the cliffs is reached. I well remember on my first visit seeing a Willow Wren, an odd bird that had probably stopped for a rest in its flight across the Forth; on other occasions I have flushed Blackbirds and Twites from the hill-sides, but I do not think any of these species breed there. The Rock Pipit is not uncommon, and of course is a resident; the Jack-

daw, the Peregrine Falcon, and the Rock Dove also breed regularly thereon. There can be little doubt that the Bass is visited by various other species of land birds during the seasons of spring and autumn migration, but, owing to the utter absence of observers, they pass unnoticed. At the isle of May, a few miles to the eastward, and where there is a lighthouse, much migration has been remarked, and several rare wanderers have been obtained. As a "stepping-stone," or resting-place for birds crossing the Forth, the Bass must often prove most welcome, although the May is more favourably situated in the path of migrants.

The one bird that predominates over all others, land birds and sea-fowl alike, is the Gannet (*Sula bassana*). As is well known, the Gannet is closely allied to the Cormorants, and by many authorities is included in the same family. There are, however, many important structural differences between the Gannets and the Cormorants, which appear to warrant the birds being placed in separate families. The Gannets are chiefly birds of the tropics, but range in the southern hemisphere at least as far south as New Zealand. But one species is found in the North Atlantic Basin, and this is the one that breeds so abundantly on the Bass. During

the non-breeding season the Gannet is seldom seen near land, spending its time in a nomad life at sea, wandering to and fro in quest of food. Its powers of wing are marvellous. It may be said literally to live in the air, only settling on the water to sleep or (and much less frequently) to digest its food. Early in spring the Gannet ceases its nomad life, and begins to gather at the old accustomed breeding-places, which are used year by year for time out of mind. At the Bass the birds appear in April, but further north at St. Kilda I was assured that the bulk of the individuals does not arrive until May. The number of Gannets that breed on the Bass has been variously estimated at from six thousand to ten thousand pairs, the latter possibly being nearest the mark. Besides the adult breeding birds there are a few immature individuals to be seen, readily distinguished by their more or less speckled plumage. The scene that bursts upon the view when the edge of the cliffs is reached beggars all attempt at description. Many writers have essayed the task of putting on paper the wonderful sight, but all have felt the utter impossibility of doing justice to the bewildering scene. It is a far more fitting subject for the graphic pencil of some accomplished artist-naturalist. The air, the cliffs,

the grassy slopes, the sea below, are filled with birds, those on the land clamouring harshly at the intrusion, those in the air drifting hither and thither, silent and apparently effortless as huge flakes of living snow. The Gannet commences to breed early in May, but nesting does not become general until the middle or even towards the end of the month. From the rough ground near the summit of the cliffs to hundreds of feet down their broken or precipitous sides Gannets' nests may be seen in every suitable spot, sometimes so close together that the brooding birds actually touch each other as they sit upon them. The nest of the Gannet is a rude affair, dirty and offensive in the extreme, and composed of turf, straw, sea-weed, and any other vegetable refuse obtainable, massed together into a conical heap, wet with droppings and slimy from fish. As incubation proceeds many of these structures are trodden out of all semblance to nests by their owners. Each nest contains but a single egg, and the observer will remark how the parent Gannet treats this solitary treasure with the utmost indifference, often standing upon it whilst barking hoarsely at being disturbed in its duties. Numbers of fish are lying about in or near the nests, half digested, freshly caught, or rotting in the sun.

But the interest of the curious scene is by no means confined to the cliffs. The fluttering throng of birds sailing to and fro is absolutely bewildering; the difficulty of following any one of these flying units in its trackless course for long together difficult in the extreme. Backwards and forwards, up and down, along the line of the cliffs, the Gannets fly, whilst numbers are constantly arriving from the fishing-grounds, or starting off to them for fresh supplies. The Gannets are by no means peaceable neighbours, and are for ever quarrelling with each other, resenting any intrusion. The effect of this may easily be imagined when the birds live in such very close companionship. Perhaps of still greater interest to the enthusiastic ornithologist is the scene some distance down the cliffs, should he possess the necessary nerve to avail himself of the assistance of a rope and climb down to behold it. Here he will also meet with various other species of sea-birds at their nests, and will find the homes of the Gannets in even greater numbers.

As he gets down the broken cliffs and reaches the more inaccessible portions, he will meet with the Guillemot, although this bird is nothing near so abundant here as at Flamborough, or on the Pinnacles at the Farne Islands, and is scattered up

and down. Every now and then odd birds will dash from the rocks with a startling whirr of wings and appear to tumble head-first down into the sea; now and then perhaps a dozen may be seen standing quietly over their eggs, anxiously watching every movement, some poking their treasure from under them, others dashing away at once and knocking off their egg in their eagerness to get away. I have repeatedly remarked that the eggs of the Guillemots breeding on the Bass are, speaking generally, much handsomer than the eggs of the same species obtained at the Farne Islands, which seems to suggest that the colour standard has been lowered by the incessant selection of the finest marked eggs by collectors, combined with the ease with which they may be obtained at the latter locality. There can be little doubt—indeed I have collected much evidence in support of the fact—that the power or capacity in a bird of producing exceptionally handsome eggs is an inherited power, and that it is continued season after season. In places, therefore, where the eggs are much taken, a bird has little chance of transmitting this power to posterity, and in the course of time these exceptionally beautiful eggs gradually become extinct. The same remarks I found also to apply to the Guille-

mots breeding on St. Kilda. During my visit I must have examined thousands of eggs of the Guillemot, yet I did not meet with one specimen remarkable for special beauty of colouring. The St. Kildan in taking these eggs has no eye whatever to their beauty, all are picked up indiscriminately, but as the handsome eggs are much the rarest they are by far the soonest exterminated. I think it may be safely said, that wherever the eggs of the Guillemot are much taken, the standard of brilliancy and variety of colour will be a low one. I have remarked in the case of the Ring Ouzel, the Song Thrush, the Common Sandpiper, the Rook, and some other species, that in certain districts the eggs have been much more richly marked than in others, and this relatively higher standard of beauty has been maintained for many seasons in succession. The subject is one of considerable interest to the scientific oologist, and requires careful investigation.

But to return to the Bass. Here and there a few Razorbills may be met with, but the bird is scarce and the eggs difficult to obtain. More interesting, owing to its greater abundance, is the Puffin. There is a very remarkable colony of this species established here in the masonry of the old fortress overlooking the sea, whilst numbers of

birds burrow into the soft earth on the cliffs, or lay their solitary egg in deep fissures of the rocks. Many Puffins may be seen visiting or leaving their nest-holes in the walls of the fortress, but otherwise the bird is not much *in evidence*, except on the surrounding sea. The Kittiwake is also a tenant of the cliffs, breeding in most abundance far down towards the sea, where the rocks fall sheer like walls of solid masonry. Odd nests may be discovered here and there in more accessible spots, but never near the top of the cliffs where the Gannets breed in such vast abundance. The noisy clamour of this beautiful little Gull is to my mind one of the most charming, as it certainly is one of the most characteristic, features of the wave-washed cliffs. A few pairs of Herring Gulls also breed on the sloping, undulating downs on the north side of the Bass. These nests are remarkably difficult to find, unless stumbled upon by accident. The birds too are excessively wary, and if the nests are not marked correctly when their owners are first flushed, nothing remains but a close and systematic search. I used often to try and surprise these birds on their nests by creeping stealthily over the brow of the hill, but every time in vain. The wary birds had invariably left their eggs, and were either on the wing or

running some distance from the nests, in spite of all my care. I think their mates gave the alarm as they wheeled and poised high up in the air above the breeding-place, for they could readily see my approach from their lofty station. The Jackdaw also frequents the cliffs of the Bass, but we are inclined to pay little attention to him, surrounded as he is by so many species of far more local interest; whilst here and there on the grassy slopes a nest of the Rock Pipit may be discovered.

Still confining our observations to the cliffs, we may have the good fortune to meet with the Peregrine Falcon. A pair of these beautiful birds breed on the Bass every season, and to my mind they are the crowning charm of this wonderful rock. Often have I watched them sailing in circles at a vast height above the rock, or seen them toying with each other opposite the cliffs where they nest. As is so often the case with raptorial birds, the Peregrines have several eyries, using one or the other in turn. None of these, however, are accessible without the aid of a rope; the man whose nerves are not sufficiently strong will therefore have to content himself with watching the parent Peregrines as they dash rapidly from the cliffs, and commence to fly to and fro, chattering their displeasure at the un-

welcome intrusion of their haunt. The nest—little more than a hollow—is made on some ledge of the cliffs, and the young are hatched before the Gannets and other sea-fowl commence nesting. Two other species must be mentioned to complete our list of the birds of the Bass. These are the Shag and the Rock Dove, numbers of which breed in the caves and fissures that honeycomb the rock, and whose haunts can only be visited with a boat.

Whilst standing on the summit of the cliffs, the visitor must not fail to notice the excessively pretty sight of the Gannets fishing. The birds may be observed engaged in this task almost in every portion of the surrounding sea. The Gannet is a plunger, capturing its finny prey by darting down from the air above, and seizing the fish in its long, spear-shaped beak. One after the other the big birds may be seen falling like blocks of flashing white marble into the water, throwing up a cloud of spray and foam where they strike the surface. Many fishermen have assured me that they have known Gannets plunge headlong into boats containing fish; and it is said that in some districts the birds are caught by fastening a fish to a board which is allowed to float on the sea. Most admirably is the Gannet adapted to its ways of life. The

air-cells on its body—its pneumatic skin—render it light and buoyant in the extreme; its wonderful extent of wing enables it to keep the air for hours without the least fatigue. It is, however, incapable of diving, and the only possible way of sinking its air-charged body beneath the water is by hurling itself down from a great height. It should also be remarked that the nostrils of the Gannet have become obsolete, probably through uncountable generations of natural selection, thus preventing any injury arising from water being driven into them by the terrific force of contact with the sea when the bird is fishing.

In August the Gannet harvest takes place, and vast numbers of the young are killed for the sake of their feathers and their fat. Formerly a large trade was done in young Gannets, the tenant of the Bass baking them and hawking them about the neighbouring country at a shilling per bird! Now-a-days, I am informed, the taste for baked “Solan Goose” has undergone a change, and the birds are almost unsalable. The feathers, too, are in less demand among the makers of feather-beds, owing to the unpleasant smell which clings to them in spite of all processes of purification. The curious visitor may see at Canty Bay the huge ovens where

the birds were baked, now I fear but little used. The demand for eggs continues good, and a fair trade is done each season amongst collectors and for culinary purposes.

Although the Bass may not be quite so rich in species as the Farne Islands, or some few other haunts of Sea-Fowl, the interest attaching to the place is certainly very great, if not unique. Probably not more than eleven species breed regularly on the rock, and of these four are strictly land birds. With the exception of the Gannet, the remaining water birds are individually small in numbers, but they form a pleasing variety, and help to emphasize the interest ever attaching to the "geese." No person at all interested in bird life should miss seeing the Bass; it furnishes an object lesson in ornithology which is so vividly impressed upon the mind that no length of time will successfully efface it.

VI.

A VISIT TO ST. KILDA.

A VISIT to St. Kilda, to do the thing thoroughly, is by no means an unmingled pleasure. In the first place, the means of transit are few, always excepting the splendidly appointed pleasure steamers that visit the island at intervals throughout the summer from Glasgow, but which are of little use to the man bent on studying the place, the people, and its birds; for not even a landing on the famous ocean rocks is guaranteed, and the boats leave the Clyde at a time of year when, from an ornithologist's point of view, most of the attraction is over. Even when the difficulty of transit is overcome, the visitor upon his arrival must be prepared to rough it, for there is no accommodation of any kind. For many years my ambition had been to visit this unrivalled bird-station, the former home of the now extinct Great Auk, and the present haunt of the Fulmar, the Fork-tailed Petrel, and the Shearwater. At last through the kindness of my friend, Mr. J. T. Mackenzie of Dunvegan, the factor of St. Kilda, I

was enabled to visit the famous islands in his smack, and to revel in their bird treasures for nearly a fortnight. This small vessel generally visits the islands twice in the year, in spring and autumn, to convey such necessities as the St. Kildans may require, and to bring back the few products of the place—oil, feathers, cloth, salt fish, tallow, and one or two hides. I might also remark that the islanders pay their rent on these occasions, either in money or in kind.

We left Dunvegan, a tiny village on the west coast of Skye, in the *Robert Hadden*, a smack of about eighty tons, at noon on Tuesday, the 3rd of June. A light wind was barely sufficient to carry us out of Loch Follart into the Minch, and we did not arrive in the Sound of Harris until early on Wednesday morning; here we lay to until daylight, for the navigation of the Straits is dangerous. The wind eventually dropped altogether, and throughout Wednesday we were becalmed in the Sound, the sea being smooth as glass. The day was by no means wasted, for we spent the time in exploring the various small islands round us, where we met with the Red-breasted Merganser, the Oyster-catcher, and the Eider Duck in abundance, and found many nests; otters and seals were also

common. The sea was alive with birds, especially Guillemots, Razorbills, and Puffins, all very tame, seldom diving until our boat was almost upon them. Now and then a party of Cormorants or Shags flew silently and swiftly by; whilst at intervals we could hear distinctly the gaggle of the Wild Geese that were breeding on Harris and Uist. Slowly drifting with the tide, we finally cast anchor off the island of Obb, and there took on board a supply of fresh water. We were under weigh again at four, and as soon as the island of Pabbay was passed we picked up a stiff and welcome breeze, which sent us into the open Atlantic; and we were soon speedily bowling along a course W.N.W., with all sails set for St. Kilda, some fifty miles ahead. We had an unusually rough passage, the seas running very high, and occasionally sweeping the deck from stem to stern. Just as dusk was falling the island of Borreay was sighted from the rigging, and the excitement of "land ahead"—far-famed St. Kilda at last—was more than enough to make us forget the discomforts of the protracted voyage and the buffetings of wind and waves. We met with very few birds *en route*. About twenty miles from the islands a few Shearwaters paid us a visit, flying just above the surface of the big waves

in silence; here and there a benighted Guillemot or a Razorbill was passed, and one or two solitary Fulmars floated Owl-like round the mast-head and then vanished in the twilight.

As we slowly approached Borreay the island became more and more distinctly outlined against the western sky, whilst beyond again, looming like a huge black shapeless cloud, St. Kilda proper rose weird-like from the sea. We eventually passed the large inaccessible rock called Levenish, which stands sentinel-like at the mouth of East or Village Bay, and finally came to anchor, as it seemed, right under the frowning hills at half-past one A.M. on Thursday. Although almost entirely land-locked, the Bay was full of heavy sea, and the night was passed in a weary watch for dawn, our little craft dancing about like an egg-shell in a mill-race, and our ears deafened by the booming of the breakers beating against the rock-bound shore. The natives were in no hurry to convey us ashore, and not until eight o'clock in the morning did they make any attempt to do so. Landing in the smack's boat was out of the question in such a sea, and can rarely be accomplished at all without assistance from shore, owing to the heavy and continuous swell. A large boat manned by half-a-dozen

St. Kildans put out to the smack, and in this we rowed to land. A party of men awaited us on shore, hauling us boat and all on to the rocks as a favourable wave washed us landwards. What a welcome we had, to be sure, for we were the first visitors, the first bearers of tidings from the outside world for nine weary months. Almost the entire population—some seventy-eight souls—headed by their faithful pastor, the Rev. John Mackay, were waiting to receive us, and hand-shaking became universal. First and foremost in his welcome was this quaint, genial old pastor, who insisted on our partaking of his hospitality, plying us meanwhile with question after question concerning the busy world we had left: “Who was Prime Minister?”—“How was the Queen and Royal Family?”—“What great ones of the earth had passed away?”—“How went the harvest?”—“What was the price of corn?” and so on. Alas! Pastor Mackay is now gathered to his fathers. Doubtless he sleeps his last sleep on the lonely island he loved so well, for when I parted from him with a hearty hand-shake years ago, he assured me, with tears in his eyes and faltering voice, that nothing could induce him to leave his little flock, and that he meant to die, as he had lived, amongst them.

The first impressions of St. Kilda are decidedly disappointing, and the view from the sea suggests that dreary barrenness which is the one dominant feature of the Outer Hebrides. As seen from Village Bay, however, St. Kilda presents a grandly majestic appearance. The deeply indented bay is in the foreground; on the left is the precipitous island of Doon, looking for the most part bare and rocky, its jagged peaks rising in many places sheer from the water, or sloping gradually in downs of greenest turf. Doon forms the southern horn of the bay, and is only separated from St. Kilda by a very narrow strait, which during certain tides is fordable at low water. At no very remote period this island evidently formed part of the mainland of St. Kilda. Next to Doon, on the mainland, rises the hill Mullach-scaill, or the Bald Top; then in the background rises mighty Connacher, overlooking all, sloping more or less gradually from the shores of the bay, and falling in a majestic precipice to the open Atlantic on the other; whilst on the right rises Mullach-oshavall, or the Top of Oswald, forming the northern horn of this remarkably picturesque bay. At the extreme western extremity of St. Kilda is the smaller island of Soay, separated by a narrow strait in which stand three lofty stacks

of rock—Stack Biorrach, or the pointed stack (the most difficult cliff to climb in the islands), Stack Soay, and Stack Doonaah, or the bad stack. On two of these rocks sea-birds breed in abundance. Soay has an elevation of more than a thousand feet from the sea, furnishes rich pasturage for many sheep, and is a favourite nesting-place of myriads of sea-fowl, especially the Manx Shearwater, which swarms to such an extent that many parts of the island are honeycombed with its burrows. The Stormy Petrel also breeds here in abundance. Four miles north of St. Kilda is the island of Borreay, with the two rock-stacks of Stack-an-Armin and Stack Lii, the latter being the grand head-quarters of the Gannets, which not only swarm on the flat sloping summit, but on all the ledges of the lofty sides. So densely do the white birds cluster on this rock that it may be seen distinctly from the Long Island, forty miles away, looking like a large ship under full sail bending to windward. Borreay also rises more than a thousand feet above sea-level, and its mighty cliffs swarm with birds. Many sheep are also pastured here. St. Kilda is the only island of the group which is inhabited by man.

As soon as I landed on St. Kilda signs of birds met me at every step. The ground near the

houses was strewn with wings, feathers, and bones ; the houses themselves smelt strongly of Fulmars ; and in a dozen different ways I was reminded that I was amongst a nation of fowlers. But few living birds, however, were to be seen. The visitor on his arrival is at once struck with the apparent scarcity of birds, and it is not until he visits the cliffs that the myriads of fowl are visible. The houses of the St. Kildans are ranged in a long crescent about four hundred yards from the shore of the Bay. Behind and before them are the patches of cultivated ground, chiefly sown with grain and planted with potatoes, enclosed by rough walls that keep out the sheep and cows. Nearer the shore stands the store, the little church, and the manse. St. Kilda is supplied with an abundance of excellent water, both from springs and the rivulets that rise on Connacher. The steep sides of this hill are bare of turf, and seared in many places by small ravines worn out by the streams which dash down in rainy weather. Upon climbing the hill in a south-westerly direction from the village, and passing over the shoulder between Mullach-scaill and Connacher, a wild and novel scene is presented, far more picturesque than that portion of St. Kilda we have left behind us. Glen Mór the “Amazon’s

Glen," or "the Glen" as it is known in St. Kilda, stretches out at our feet sloping gently down to the distant Atlantic at West Bay. The hills on either side of this romantic glen fall almost sheer down in precipices to the sea, and on them Fulmars, Guillemots, Razorbills, and Gulls rear their young, whilst here and there a few Shearwaters burrow into the rich soft soil. At the extremity of the glen the cliffs are low and the shore is very rocky; but a landing can sometimes be made here when the usual place in Village Bay is inaccessible. In this glen the finest pasturage in St. Kilda is to be obtained, and here most of the cows are grazed, the women-folk going twice each day to milk them. Not a tree nor a shrub relieves the monotony of the bare hillsides or sheltered valleys of St. Kilda, but grass grows luxuriantly, making the place literally an "emerald isle"; whilst primroses, sorrel, and many other plants and weeds thrive on the cliffs and sloping downs. The hillsides are studded with numbers of rough hovels, locally called "cleats," made of boulders and roofed with turf, in which the St. Kildans dry their "turfs" for fuel, and their grass for hay, and in which the sheep take refuge during inclement weather.

It is said that the present natives of St. Kilda

are the descendants of criminals that were banished to the islands; but on the other hand, there is a tradition amongst the people themselves that their forefathers were smugglers or outlaws. I found the male population exceedingly civil, obliging, merry fellows, anxious to assist me in every way they could, but always with an eye to the "baw-bees"—the result of contact with tourists. The ladies, too, were not wanting in hospitality to the "Sassenach" (as we southerners are termed), many of them bringing eggs and birds as soon as it became known that I had come to the islands especially to collect and examine such objects.

Strange as the fact may seem, when I landed at St. Kilda scarcely a sea-bird was to be seen, save a few Puffins and Gulls in the Bay; the great bird-stations are behind the hills, where the cliffs fall almost sheer down to the open Atlantic, and on the adjoining islands and stacks. Land birds, however, were much more apparent. One of the first to arrest my attention was the Hooded Crow, remarkably tame, perching on the roofs of the cottages with as little concern as the Sparrow in a crowded city. Next to this species the Starling and the Wheatear were the most common, the latter bird being a regular spring visitor. I had

also not been ashore long before the Wren attracted my notice, and I saw at once that it was not the typical British form. Unfortunately when I reached St. Kilda the great annual egg harvest was nearly over, and of the hundreds of eggs I took from the rocks but very few were fresh enough to blow. Fortunately, however, the Fork-tailed Petrels are rather late breeders, and they had only just commenced laying. The St. Kildans eat vast quantities of eggs, especially those of the Fulmar and of the various species of Auks. I was also astonished at the state in which an egg would be eaten, the highly-incubated ones being just as palatable—perhaps even more so—as those that were newly laid!

St. Kilda is an ideal commonwealth. Each morning the adult population will consult together as to what business is to engage their attention during the day. Even the most simple affairs of daily life are seriously debated—all work in union and for the common good. Shops there are none, and so far as I could see barter was unknown. The cliffs of St. Kilda are divided equally amongst the inhabitants—just like so many allotment gardens, and a man seldom or never poaches on the preserves of his neighbours. Each year the rocks

are portioned out anew, the Saxon Mòd or Council assembling for the purpose, so that no vested interests accrue in cliffs that are more prolific in bird produce than others. The adjacent islands of Doon, Soay, Borreay, and the several "stacks" are common property, and are hunted at intervals by a party despatched in one of the boats for the purpose, the produce of the expedition being shared equally. The widows and orphans are not forgotten, and are supported by a voluntary toll from their more fortunate neighbours, having also an equal share in the cliffs and so on. The St. Kildans are adepts at catching birds; small wonder, when we bear in mind that the chief sustenance of these people is the myriads of sea-fowl that frequent the islands. But as for the men's feats amongst the rocks as climbers, about which I had heard so much, I saw nothing extraordinary. The climbers at Flamborough are every bit as daring. In fact, high as the cliffs at St. Kilda are, they are comparatively easy to climb, being for the most part broken up into ledges and grassy downs, few of them falling sheer down to the sea. Even the mighty cliff of Connacher (1200 feet high, and perhaps the finest precipice in the British Islands) does not fall sheer for that distance, but much of

it is broken up into ledges and turf-covered slopes, on which the Fulmars especially delight to nest. The Fulmar is the national bird of St. Kilda, even more important to the natives than the Gannet. No gamekeeper watches his preserves more jealously than the St. Kildan his Fulmar nurseries, and every time I went near to the cliffs where the highly-prized bird was breeding, if I chanced to have a gun with me, several men or boys were sure to follow and warn me off the sacred spot. Every St. Kildan almost constantly wears a coil of rope slung round his body, and a strong clasp-knife hung with a string round his neck. Formerly the ropes were made of hair, and handed down as heir-looms or marriage presents from one generation to another. Now ropes of hemp are almost if not entirely used. The dress of the St. Kildans is very similar to that of the Highland peasants generally, and shoes and stockings are dispensed with except on Sundays and special occasions. Only Gaelic is spoken, but the minister converses in English with his visitors.

As I was anxious to obtain a few examples of the Fulmar, I got Donald M'Queen, the best cragsman and fowler in the island, to accompany me one evening to his allotment in the cliffs for the

purpose of getting them, and also to see his method of catching birds. After arming himself with a rod, about ten feet in length, at the end of which, fastened on to a hazel twig, was a horse-hair noose stiffened like a driving-whip with Gannet's quills, we started for the rocks. This snaring-pole is kept in a place of safety in the cottage, and looked after as carefully as the blow-pipe and poisoned arrows of the South American Indian. It is also used as a support or even as a leaping-pole when the fowler is at work on the cliffs. Notwithstanding the gale that was blowing from the north-west, Donald fearlessly descended the cliffs and crept stealthily as a cat towards the Fulmars that were sitting on their nests all unconscious of harm, and then carefully passing the rod towards one of them he slipped the fatal noose over its head and drew the fluttering captive towards him. The Fulmars sitting near seemed little concerned at the fate of their companion; they appeared almost as though they were under the influence of some spell, and he was able to snare as many as we wanted with the smallest possible trouble. Donald was also most careful to take the egg as well, putting it for safety into his capacious Scotch bonnet. My success, or rather want of it, was very different when I tried to follow

Donald's example; not a bird was foolish enough to wait for me to place the noose over its head, and in spite of all my care and cunning I did not snare a single Fulmar. All the sea-birds that frequent the islands are caught in this manner. As soon as they are taken the fowler usually breaks their necks and hangs them in his belt, or ties them by the neck in bunches. Most of the Puffins, however, are caught in horse-hair nooses which are fixed on cords and set in various parts of the cliffs and downs where the birds breed. The women attend to most of these Puffin snares. Great numbers of Puffins and Shearwaters are taken from their holes, either by the fowler himself or his dog, which is trained for the purpose. When climbing the more difficult parts of the cliffs the St. Kildans go in parties; sometimes two men go together, more often three or four—one descending the cliffs, the others standing on the summit to manipulate the ropes and to assist their companion to explore those parts of the rocks where eggs and birds are most abundant. One of the ropes is generally fastened round the climber's waist, and paid out by the men at the top as it is required, whilst the other rope is suspended over the cliff by a stake, and is used to

relieve the body-rope as much as possible. As is usual in nearly all cliff-climbing, the greatest danger arises from the loose pieces of rock that are liable to fall on the fowler. Accidents are not of very frequent occurrence, and are usually the result of gross carelessness. Donald pointed out the place to me where his own father lost his footing and was dashed from the giddy height into the sea below. I climbed over the exact spot, which seemed to me one of the most unlikely places in the cliffs for such an accident to happen. The great ambition of a St. Kildan is to excel as a cragsman, to become a successful fowler; in fact, until a man has performed certain feats of daring in the cliffs he never wins a wife! The man who fails to scale the beetling Stack Biorrach is said never to win a St. Kildan maiden's heart. In former days this proof of daring used to be performed before the entire community, but whether this be so now-a-days I know not.

Sea-birds form the staple food of the people of this remote island, the Puffin, the Gannet, and the Fulmar being the favourites. These birds are caught in enormous numbers and salted down for future use, the feathers and oil being exported. Great numbers of Puffins are simply plucked, split

open and dried, being strung across the ceilings of the cottages and taken down as required. A mummified Puffin is one of the dainties of St. Kilda. It is recorded that upwards of 89,000 Puffins were caught by the St. Kildans in 1876. These people are also passionately fond of sweets, even to childish greediness, and these were the first articles asked for on our arrival; tobacco came next. It is probably owing to this bird-diet of the adult population, that nearly every infant born in the island succumbs to what is known there as the "eight day fever," usually proving fatal on the eighth day after birth. "Stranger's Cold" is another peculiar disease, the arrival of any visitors generally being followed by a kind of influenza which spreads throughout the population. Ophthalmic diseases are also prevalent.

Much has been said concerning the difficulty of landing and the anchorage at St. Kilda. The only place at which a landing is attempted is on the rocks below the manse, and boats require the most skilful management, even in the finest weather, for there is always a considerable amount of surf and ground swell. During the whole time of my stay there was an exceptionally heavy swell; so bad, in fact, that I was unable to land on any of the

adjoining islands and stacks, with the exception of Doon, which a few hours' comparative lull enabled me to visit. The heavy seas that from time to time break over St. Kilda are almost past credence; in some winters the waves are carried over shoulders several hundred feet high and sweep in torrents down the hillsides. During fine weather and favourable winds the anchorage is excellent, but should bad weather or contrary winds threaten, the mariner must make all possible haste out of treacherous Village Bay, or do as my friend Mackenzie does, make all snug, drop another anchor, and abandon his vessel to her fate, to ride out the storm or go to the bottom!

The *Robert Hadden* left St. Kilda as soon as her cargo was discharged, and for a week or more we were as completely isolated from the civilized world as if we had been in the heart of Africa—far without the charmed circle of Her Majesty's Post-Office, and utterly removed from the telegraph system. The repose of the place then became thoroughly apparent, and I passed the quietest days of all my life on these ocean rocks, amidst their primitive people and their myriads of birds. We made the two-roomed house near the shore and the chapel (built for the accommodation of the Factor,

I believe) our head-quarters, which after a thorough overhaul and cleaning up was at last made habitable. Its great drawbacks, however, were damp and *Pulex irritans*, the former endowing me with rheumatics, from which I have never since been free, and the latter making indoor life a burden, especially at night. To hear the chanting song of the St. Kilda men outside our door, however, made ample amends for our discomfiture, to say nothing of the Fulmars, the Fork-tailed Petrels, and the Peregrines! In about ten days' time a pleasure steamer, the *Dunara Castle*, from Glasgow, arrived, in which I left St. Kilda with many regrets and leave-takings tinged with sadness, for the people of the place had shown me every kindness, and done all in their power to render my stay amongst them as profitable as it had been pleasurable. Before finally leaving St. Kilda, the steamer made a circuit of the islands, firing a small cannon at intervals to scare the birds from the cliffs. The wild grandeur and picturesqueness of St. Kilda and its neighbouring isles can only be seen to advantage from the water; then the endless variety of form and colour which their impressive headlands and lofty cliffs assume may be viewed in all their lonely sublimity, the scene being constantly vignettied in

the countless swarms of sea-birds that literally darken the air. The reader who may or may not contemplate a visit to St. Kilda will probably appreciate a short list of the birds that either regularly frequent the islands or pay more or less irregular visits to them. I also append the St. Kilda names of such species as are known to the natives.

1. WHITE-TAILED EAGLE *Haliaëtus albicilla* (Brisson). Irregular visitor. Would probably breed here if left unmolested; but as soon as a pair may chance to make a nest the natives draw lots as to who must undertake the perilous task of climbing the cliff and setting fire to the structure. The St. Kildans fear that the Eagles would destroy the sheep and lambs.

2. PEREGRINE FALCON *Falco peregrinus* (Gerini). Breeds in isolated pairs amongst the least accessible cliffs, notably on Doon.

3. KESTREL *Falco tinnunculus*, Linnæus. Irregular visitor; no evidence of its breeding on the islands.

4. SPARROW-HAWK *Accipiter nisus* (Linnæus). Irregular visitor; may possibly breed here.

5. SONG THRUSH *Turdus musicus*, Linnæus. Occurs rarely on passage.

6. REDWING *Turdus iliacus*, Linnæus. "Smear-ach." Occurs in flocks on migration during May and September.

7. BLACKBIRD *Merula merula* (Linnæus). "Londutha." Occurs on spring and autumn migration.

8. WHEATEAR *Saxicola ænanthe* (Linnæus). "Clacharan." Very common on St. Kilda, and one of the most conspicuous land birds in the islands.

9. ST. KILDA WREN *Troglodytes parvulus hirtensis*, Seebohm. "Dhra-in-down." The one bird peculiar to the islands. For a full account of the history of this species, confer *Our Rarer Birds*, p. 72; *Nests and Eggs of British Birds*, p. 152.

10. RAVEN *Corvus corax*, Linnæus. "Fiach." Resident and breeds in the islands.

11. HOODED CROW *Corvus cornix*, Linnæus. "Fannag." Very common in St. Kilda, breeding abundantly on the cliffs. All those I saw were thoroughbred, no strain of Carrion Crow apparent.

12. ROOK *Corvus frugilegus*, Linnæus. "Rock-eish." Occasionally seen in St. Kilda during winter.

13. STARLING *Sturnus vulgaris*, Linnæus. "Druit." Fairly common in St. Kilda, breeding in the "cleats," and occasionally in holes in the ground.

14. HOUSE SPARROW *Passer domesticus* (Linnæus). May possibly occur accidentally. I saw nothing of this species.

15. TREE SPARROW *Passer montanus* (Linnæus). Frequents the islands in small numbers and breeds there.

16. TWITE *Linota flavirostris* (Linnæus). Not uncommon, but doubtless breeds on the islands. I saw flocks of young birds in June.

17. CORN BUNTING *Emberiza miliaria*, Linnæus. Reputed to frequent the islands; I saw nothing of this obtrusive species.

18. YELLOW BUNTING *Emberiza citrinella*, Linnæus. I saw one example.

19. BARN SWALLOW *Hirundo rustica*, Linnæus. Visits the islands some years not others. Is not known to breed here with certainty.

20. PIED WAGTAIL *Motacilla alba yarrellii*, Gould. "Brachd-an-t'sil." Visits St. Kilda during spring and autumn migration, but the natives say that it does not breed there.

21. MEADOW PIPIT *Anthus pratensis* (Linnæus). Occurs sparingly on St. Kilda, where it breeds and is a resident.

22. ROCK PIPIT *Anthus obscurus* (Latham). Breeds sparingly in the islands.

23. SKYLARK *Alauda arvensis*, Linnæus. Occasional visitor.

24. ROLLER *Coracias garrula*, Linnæus. One example appears to have been observed on St. Kilda about half a century ago.

25. CUCKOO *Cuculus canorus*, Linnæus. "Cuach." Occasionally visits the islands. Its appearance is regarded with awe by the natives, who say that it portends a calamity—the death of Macleod, the proprietor of the islands.

26. ROCK DOVE *Columba livia*, Brisson. Frequents the islands in small numbers and breeds on them.

27. PTARMIGAN *Tetrao mutus* (Montin). One example has been seen on St. Kilda after strong easterly winds.

28. HERON *Ardea cinerea*, Linnæus. "Gorridhgrid-heach." Accidental visitor. The natives generally pick them up dead—starved, as the water round the coast is too deep to admit of the birds catching food. The St. Kildan sometimes stalks and snares this bird as it stands upon the rocks.

29. CORN CRAKE *Crex pratensis*, Bechstein. "Trien." Occasional visitor on migration, more abundant some years than others, and always chiefly in autumn.

30. OYSTERCATCHER *Hæmatopus ostralegus*, Linnæus. "Treallachan." Breeds on the islands in small numbers.

31. GOLDEN PLOVER *Charadrius pluvialis*, Linnæus. Very occasional visitor.

32. TURNSTONE *Strepsilas interpres* (Linnæus). Has been thought to breed on the islands, but hitherto all proof of the fact is wanting.

33. CURLEW *Numenius arquata* (Linnæus). "Guilbnaach." I saw one or two pairs of this species, which may have been breeding in Glen Mòr or on Doon.

34. WHIMBREL *Numenius phæopus* (Linnæus). I saw one pair of these birds. Whether it breeds here is yet unknown.

35. COMMON SANDPIPER *Totanus hypoleucus* Linnæus. Sir William Milner states that he saw this species on the islands in June forty-five years ago.

36. DUNLIN *Tringa alpina*, Linnæus. Gray asserts that this species breeds on the islands, but I think erroneously. It is, so far as I can learn, only an occasional visitor.

37. COMMON SNIPE *Scolopax gallinago*, Linnæus. "Niiskin." Said to be a resident on St. Kilda. I failed to see anything of this species.

38. WOODCOCK *Scolopax rusticola*, Linnæus.
“Ootacac.” Probably passes on migration.

39. GREAT BLACK-BACKED GULL *Larus marinus*, Linnæus. “Farspach.” Common, and certainly breeds in more or less abundance on Doon and Soay. Much disliked by the natives because of its egg-stealing propensities.

40. LESSER BLACK-BACKED GULL *Larus fuscus*, Linnæus. Breeds in considerable numbers on the various islands and stacks.

41. HERRING GULL *Larus argentatus*, Gmelin. Widely distributed over the islands, but nothing near so common as the preceding species.

42. COMMON GULL *Larus canus*, Linnæus. Is said to frequent the islands, but I did not observe this species.

43. KITTIWAKE *Larus tridactylus*, Linnæus. “Ruideag.” By far the commonest Gull in St. Kilda, many of the cliffs being white with them. Said to arrive in April and to leave in August.

44. GREAT SKUA *Stercorarius catarrhactes* (Linnæus). An irregular visitor.

45. RED-BREASTED MERGANSER *Mergus serrator*, Linnæus. “Sheiltach.” A rare visitor, the coasts being scarcely suited to its requirements.

46. EIDER DUCK *Somateria mollissima* (Linnæus).

“Gochach.” Not very common, but certainly breeds on Doon. I noticed as many as half-a-dozen pairs swimming together in the Bay.

47. KING EIDER *Somateria spectabilis* (Linnæus). Certainly frequents St. Kilda, although no evidence of its breeding there has yet been obtained. Conf. *Game Birds and Wild Fowl of the British Islands*, p. 447.

48. SWANS *Cygnus*, spec. in. Swans occasionally visit the islands; but the species has not yet been determined.

49. GREAT NORTHERN DIVER *Colymbus glacialis*, Linnæus. “Bunna Chuachel.” Accidental visitor.

50. COMMON GUILLEMOT *Uria troile* (Linnæus). “Lamhaidh.” Frequents the cliffs in vast numbers.

51. BRUNNICH’S GUILLEMOT *Uria bruennichi*, E. Sabine. Sir William Milner states that this bird breeds on St. Kilda. It is very possible that it may do so, but there is no recent testimony in support of the assertion.

52. BLACK GUILLEMOT *Uria grylle* (Linnæus). “Gearadh-breacha.” Not uncommon, but much less abundant than the Common Guillemot. It certainly breeds on Doon as well as St. Kilda.

53. LITTLE AUK *Mergulus alle* (Linnæus). Rare winter visitor.

54. RAZORBILL *Alca torda*, Linnæus. "Falcadh." Almost as abundant as the Guillemot.

55. GREAT AUK *Alca impennis*, Linnæus. "An erbhoil." St. Kilda was perhaps the only part of the British Islands where this now extinct species ever bred. Martin was probably the first naturalist to give us any information of this bird from personal observation. He states that it is "the stateliest as well as the largest of all the Fowls here," and that "he flyeth not at all, lays his (*sic*) egg upon the bare rock, which if taken away, he lays no more for that year." The Great Auk, so far as we have any record, does not seem to have bred there regularly. The last specimen that was taken at St. Kilda appears to have been in 1822. I am convinced that much of the information which has been gathered at St. Kilda respecting the Great Auk is very unreliable. I should say that the Great Northern Diver has been confused with it more than once. I was informed that half a century ago a Great Auk was said to have been stoned to death on Stack-an-Armin, the natives believing it to be an evil spirit. The old man who had assisted at this ornithological sacrilege recognized at once the drawing of the Great Auk which I had brought with me, but none of the younger men

appeared to know anything about this unfortunate species.

56. PUFFIN *Fratercula arctica* (Linnæus). "Bou-gir." Frequents St. Kilda in incredible abundance. See *Our Rarer Birds*, p. 265.

57. CORMORANT *Phalacrocorax carbo* (Linnæus). Occurs very sparingly at St. Kilda.

58. SHAG *Phalacrocorax graculus* (Linnæus). "Sgarbh." Commoner than the preceding species, and breeds in the caves and crevices.

59. GANNET *Sula bassana*, Brisson. "Souler." Breeds in thousands on Borreay and the adjacent stacks. Arrives in May, leaves as soon as the young (which the natives call "Gugha") are strong on the wing.

60. FULMAR *Fulmarus glacialis* (Linnæus). "Ful-a-mair." *Par excellence* the bird of St. Kilda. For a full description of this species see *Our Rarer Birds*, p. 292.

61. MANX SHEARWATER *Puffinus anglorum* (Tem-minck). "Scrapire." Very common, especially on Soay. Conf. *Our Rarer Birds*, p. 286.

62. STORMY PETREL *Procellaria pelagica*, Linnæus. "Assilag." Very common, especially on Soay. It also breeds on Doon and Borreay in June.

63. FORK-TAILED PETREL *Procellaria leachi*, Temminck. Breeds on Soay, Borreay, and Doon. Conf. *Our Rarer Birds*, p. 300.

A perusal of this list will show how rich St. Kilda is in interesting birds, and how well the wonderful islands will repay a visit.

VII.

THE ARTIST'S BIRDS.

BUT very few Artists, save those who make Ornithology a special study, possess sufficient knowledge, even of the most elementary character, to introduce the Bird correctly and effectively into their works. It is cause for surprise that the artist who portrays inanimate nature with such marvellous fidelity and feeling should become so palpably inaccurate when his pencil depicts animate life, and especially bird-life. Nowhere has this been more forcibly exemplified to the present writer than at the exhibitions of the Royal Academy. It may be safely said that these annual collections of works thoroughly represent all the best artistic talent of modern times; so that a critical review of these pictures applies to British Art generally. So far as Ornithology is concerned this is universally and lamentably true. In no branch of his work does the artist's mind seem less educated in that fidelity to detail which Nature inexorably demands as in

that which depicts birds and bird-life. As a consequence, many good pictures have been and continue to be utterly spoiled where the painter rashly essays to take birds as part of his subject. His faults may be in two directions. Either from his ignorance of the bird's anatomy, the structure and arrangement of its feathers, and the mechanical laws that govern the movements of its legs and wings, his drawings may be hopelessly wrong; or, having no knowledge of the habits, haunts, and characteristics of the species he elects to paint, he falls into errors of detail, sufficient to brand his work as faithless to nature. The cause of much of this inaccuracy is that artists are too fond of painting their birds from stuffed specimens, often wretchedly mounted; or, which is more unpardonable still, of copying them from books on ornithology, which in nine cases out of ten are full of those very errors which they as artists should seek to avoid by going to Nature for their inspirations. As the artist goes to Nature for his rocks and trees and water and sky, so he must seek her for his birds. The artist must become a naturalist as well if he wishes to acquire those skilful touches which imbue with life the birds and beasts he puts upon his canvas. Art and Nature are inseparable; and the

mind which is constantly being exercised in noting the peculiarities in rock and tree and water, should be employed just as lovingly and patiently in tracing the habits and characteristics of the furred and feathered creatures that inhabit them. He will then be able to catch the happiest and most expressive attitudes of the various birds, and to surround them with those faultless details which so largely assist him in making an effective and truthful picture. He will then know what to select and what to avoid; for among birds there are species which never tell to advantage, however skilfully they may be introduced; just as there are trees and rocks and cloud effects which make bad subjects, however well they may be treated.

At a very recent exhibition I found many works hanging at the Royal Academy which strikingly illustrated the truth of the preceding remarks. For instance, in one large painting we are shown a group of Swans and Cygnets, on what I took to be a Highland Lake, seeing that a Golden Eagle is in the act of swooping down upon them. In the first place, it is a decided error to place the Mute Swan (*Cygnus olor*) on a mountain lake. This species is nowhere wild in the British Islands. It lives in a state of semi-domestication under the protection of

man in broads and rivers, or on ornamental waters, and is never known to breed on the wild Scottish lochs—the haunt of the Golden Eagle. In the second place, it must be remembered that the Mute Swan is one of the most pugnacious of birds, especially during the breeding season, jealously guarding a particular part of the water from all intruders. In the face of this fact, however, the artist shows *three* adult swans swimming peacefully together in company with a pair of cygnets! Another great error in this elaborate painting is to be remarked in the swooping Eagle. Apart from the fact that it is very improbable that a bird of this species would attack one Swan, let alone three, as the Golden Eagle is a cowardly fellow, generally molesting weak and defenceless creatures only, the manner in which the attack is being made is wrong. All the Birds of Prey (*Raptores*) strike with their legs and feet alone, never with their beak, which is reserved for the purpose of tearing the captured bird or animal in pieces. Yet in this picture we are shown the Eagle in the act of striking at the Swans with beak as well as with feet. Such errors as these seriously detract from the artistic merits of such an imposing work—mistakes that might easily have been averted

had the painter possessed even small knowledge of the habits and economy of the Eagle and the Swan.

Then I noticed an interesting picture of startled Wild Ducks (*Anas boschas*) flying from the reeds, which may be aptly taken as an illustration of another error into which most painters fall when portraying a bird in the act of flight. Even if the bird be fairly well poised in the air we generally find that the wings are not placed correctly, but usually with the innermost secondaries at some distance from the body. Did this space exist in nature much of the motive power of flight would be lost by allowing the air to escape through it, instead of forming an unbroken line of resistance. But no such waste occurs, and during flight the scapulars and innermost secondaries fit close to the body, furnishing considerable support to the bird and resistance to the atmosphere. A bird's wing is admirably formed for the purpose of flight, as any one may see who cares to take the trouble of making an examination; and to paint this beautiful structure in a distorted, unnatural position is to sacrifice any artistic merits a picture may possess to the want of the merest rudiments of ornithological knowledge. Another indoor-study of Wild Ducks, for it could never certainly have been taken from the

life, representing a bunch of these birds hurrying from a fringe of tall reeds, also displays a sad want of technical knowledge. In the first place, flowering water-lilies indicate the height of summer, a season when the Wild Duck is most unsocial, and when the drakes (in a brown, unassuming plumage) are moulting, and skulking in their habits, and the ducks are busy with their broods. Then again, the artist places the drakes in the foreground, which is literally playing "ducks and drakes" with Anatine etiquette. The observer will find that it is the rule, when these birds are alarmed, for the drakes to wait until the ducks are well on the wing before they attempt to follow them! We can quite sympathize with the artist in wishing to place handsome drakes in the foreground of his picture, and to introduce the pretty flowers to lend an additional charm to the clear still pool, but it has been done at the expense of sacrificing truth to effect.

Another picture which impressed me was a study of Gulls grouped on a sandy shore. I presume the birds are Lesser Black-backed Gulls (*Larus fuscus*), from the dark-gray colour of the mantle, and that they have been drawn from stuffed specimens or from examples in captivity. Now had the artist gone to Nature for his birds, he would have found

that it is the exception not the rule for the immature birds to flock with the adults. The larger Gulls are several years advancing to maturity, and do not breed nor mix much with the old birds until they have at least got rid of the brown plumage of their youth. What is evidently a very young bird is portrayed in this picture, showing traces of adult plumage on the mantle and scapulars, but these feathers are among the last to change their colour when the Gull has almost reached the fully adult stage of its existence. We thus again see how want of knowledge of the habits of the Gulls, and of their various phases of plumage, have led the artist into serious errors which mar an otherwise pleasing work. Of all the admirable sea-pieces in the exhibition to which these remarks more particularly refer, whether of lofty rugged rocks, flat sandy shores, or restless sea in ever-changing mood of calm and storm, in which Gulls have been introduced, not one artist has depicted them correctly. In many of the works I noticed the painter has had exceptionally good opportunities for bringing in this graceful sea-bird where its presence would have been an important acquisition to the general effect of the scene portrayed. Where the birds were shown a few splashes of black and white pigment, usually in the shape of

the conventional V, do duty for the Gull. In one instance only did the artist attempt anything more, but his bird was faulty, and gave one no idea of the graceful Gull as it is at home, flying buoyantly over a stormy sea. The attitude for a bird in the air was wrong, the body was too small in proportion to the wings. The primary feathers of the latter should have been drawn recurved at the tips, as would certainly have been the case in the gale of wind which the artist wished us to feel was sweeping over the sea in squally gusts. I wondered deeply at this inaccuracy, for of all birds the Gulls are perhaps the easiest to study, as they poise and turn and hover above the water within a stone's throw of the observer. The characteristics of their flight can be readily transferred to canvas, when once the artist has made himself thoroughly acquainted with them. Not only can he give a lifelike representation of these birds, but by a few skilful touches he may impart their specific identity. So far as British Gulls are concerned, this is readily done. The Lesser Black-backed Gull (*Larus fuscus*) and the Great Black-backed Gull (*Larus marinus*) are distinguished from all other species by their dark-gray mantle, and the former from the latter by its smaller size and yellow instead of flesh-coloured legs and

feet. The Herring Gull (*Larus argentatus*) is readily shown by its large size and pale-gray mantle combined. The Common Gull (*Larus canus*), though similar in colour, is much smaller, and the bill, legs, and feet are strongly suffused with green. The Black-headed Gull (*Larus ridibundus*), as its name implies, is characterized by its dark-brown hood in summer, and by its coral red beak, legs, and feet at all seasons; whilst the Kittiwake (*Larus tridactylus*) is readily identified by its gray instead of black quills, in conjunction with its rock-haunting habits. This latter Gull is the Gull *par excellence* of the beetling rocks; just as the Black-headed Gull is the one to introduce on inland pastures and swampy grounds.

In this particular exhibition, with one or two praiseworthy exceptions, the artists have been just as unsuccessful in their treatment of the land birds. Let me hasten to accord praise where it is due. One of the most charming bird pictures in the galleries was a small painting of Peregrines (*Falco peregrinus*). Although so small—little more than a vignette in fact—the picture was admirably painted, showing how birds *can* be painted by an artist who, as I happen to know, is an enthusiastic naturalist too. Two clever drawings in water-

colours, one of Black Game (*Tetrao tetrix*) and the other of Partridges (*Perdix cinerea*), also brought with them the scent of the moorlands and the fields. Again we have the work of an artist-naturalist—of one who evidently makes it his business to study the habits and peculiarities of the birds he portrays. In one minor detail, however, the “old Adam” breaks out. By painting two birds of each sex an impression is created that Black Grouse are monogamous instead of polygamous; neither do the cocks and hens consort much in autumn, the season inferred from the accessories. Several small drawings of Blue Titmice (*Parus cæruleus*) bring me back again to the unpleasant task of finding fault. In one drawing we are shown a pair of these birds on the ground—evidently painted from badly stuffed specimens, and by an artist ignorant of the arrangement of a bird’s plumage. Now the Blue Titmouse is not a ground bird by any means, but spends most of its time among the slender branches and twigs, which it diligently searches for food. How much better then would this study have been had the pert, comical little birds been shown clinging to some long drooping twig, and not clothed in ragged (artistic?) plumes, but neat and trim and lively, as they always are in life?

Many birds that have been introduced into pictures fairly puzzle the ornithologist as to their identity. How many times have I heard the question asked, "What birds are those?" and what widely divergent answers have been volunteered. Now the unfortunate objects were Crows, anon Swallows, and later still fancy had turned them into Blackbirds! Better far had such ornithological travesties been omitted altogether. For the artist there can be and is no excuse—he has it in his power to give correctly, on however small a scale, the birds he seeks to portray; but to do so he must study them as carefully as he would any other natural objects. How often, for instance, do we see the Waterhen (*Gallinula chloropus*) caricatured. This bird is remarkably neat in its outline and most graceful in its movements. These traits should be preserved. Another fault which must be noticed is the way in which an artist strives to conceal his ignorance of the dermal covering of birds, especially the smaller feathers of the wings (greater, median, and lesser coverts, scapulars, and innermost secondaries), by dauby clouds of colour which portray nothing in particular, save the painter's want of technical knowledge.

It is rather an interesting fact, that the birds with

which the artist is most successful are those living in a state of domestication or under the protection of man. This goes far to prove that painters neglect their golden opportunities of studying wild bird-life, and when called upon to portray it trust to memory, to stuffed specimens, or to faulty pictures. Domestic birds are easy to observe, and the painter can study them throughout the progress of his work—hence the reason of his greater success. The birds selected by the artist at present are remarkably few, the number of species represented, or misrepresented, being probably less than a score. This seems surprising when we know there are hundreds of birds that might be portrayed to advantage, and at the same time introduce an element of variety which would be as welcome as it would be fresh. The hackneyed Gull, which may be any one of the half-dozen common British species; the Crow, which does duty for anything and everything black; the stereotyped **V**, which is anything from an Eagle to a Wren, together with domestic poultry and Pigeons—these are the artist's birds, on which he chiefly if not entirely relies to lend a sense of life to his work. Once let the artist be brought to see the error of his ways in this direction, and there can be no doubt for the

results. As a rule, artists are keen observers, and once let them be made to feel the want of a greater variety in their bird subjects, and we shall quickly reach a higher standard of accuracy. A man cannot paint bird-life with the touch of a master without giving to the birds careful observation, and with that observation a practically limitless field of artistic work will be opened out. We have a right to demand and expect accuracy of detail from artists who presume to place on their canvas any of Nature's beautiful and faultless handiwork.

Now let us leave the few stereotyped "painters' birds" and glance at some of the species that the artists have so long and so unaccountably neglected. We will commence with those that should belong to the marine painter. Among all the varied phases of bird-life, there are no birds more effective when introduced into a picture than those to be found on the shore. What more strikingly beautiful, for instance, than a flock of Terns sporting fairy-like above a dark-green sea? Aptly indeed have they been named the Swallows of the deep—they live almost in the air, and must be classed among the most graceful of birds. A dozen species are classed as British, but out of these not more than four are common in British seas. All these

are summer visitors to our islands, and all are remarkable for their gregarious habits and dexterity of aerial movement. These four species possess the following characteristics in common. They have a black cap, extending on to the nape, and the colour of the upper parts is French gray, darkest on the quills and wing coverts. The wings are long and pointed, the tail is acutely forked, the outermost feathers being remarkably long and narrow, whilst the beak is long and slender and nearly straight from the base to the tip. The largest and rarest of these species, the Sandwich Tern (*Sterna cantiaca*), is characterized by its size, its black beak tipped with yellow, proportionately less acutely forked tail, and pure white under surface. The Common Tern (*Sterna hirundo*) and the Arctic Tern (*Sterna arctica*) are very similar in appearance, but peculiarities of the former species are its orange-red beak tipped with black, and very pale French gray (almost white) underparts, the beak of the latter species being rich crimson, and the underparts a much darker tint of gray. The Lesser Tern (*Sterna minuta*) is the smallest European species, and is further distinguished by its white forehead, yellow beak tipped with black, and white underparts. We need only make a passing

allusion to the beautiful effect these birds produce by their bold contrast of colour and delicate outline, either when following a shoal of fry, attending the fishing-boats, or flitting buoyantly up and down the little creeks amongst the limpet-covered and sea-weed draped rocks of their island haunts; or, yet again, at their breeding-places, where they literally fill the air like a living snowstorm.

Let us now pass on to some of the other sea-birds. It would seem that the majority of marine painters are ignorant of the existence of any other sea-fowl but Gulls, and consequently those birds are introduced into every description of littoral scenery. But every part of the shore has its peculiar birds. The bold rugged headlands rising sheer from a restless sea are the abode of the Auk family, represented in our islands by the Guillemot (*Uria troile*), the Black Guillemot (*Uria grylle*), and the Razorbill (*Alca torda*). The Guillemot and the Razorbill crowd in incredible numbers on the ledges and in the crannies and clefts of the cliffs. Well drawn, these birds make admirable subjects for the painter, their black and white plumage being displayed in effective contrast. The two species are very similar in colour, but the Guillemot is easily distinguished by its long narrow beak, that of the

Razorbill being broad and short, and crossed with a narrow white line. But the artist must be careful in his treatment of their plumage, which varies considerably according to season. These birds only frequent the rocks in summer, and then they are in breeding plumage, characterized by the smoke-black throat and neck, which in winter are white, uniform with the rest of the underparts. Let the painter bear in mind that the plumage of many other birds changes in colour with the season; nuptial ornaments are assumed and lost; whilst much diversity is due to sex and age. The Puffin (*Fratercula arctica*) also belongs to the family of Auks, but prefers to frequent low islands, precipitous downs, and the summits of the cliffs, where it burrows into the soft earth to make its scanty nest. The painter will also do well to follow this interesting bird out to sea, for when engaged in fishing it forms a remarkably pretty object for a marine picture. Carefully painted from nature, the Puffin, with its bold contrast of colour, brilliantly tinted beak, and exceedingly comical facial expression, is one of the best bird subjects an artist can select. Another bird in quiet harmony with the Scottish lochs is the Red-breasted Merganser (*Mergus serrator*), a species of Duck singularly beautiful in colour, and insepar-

ably associated with the wild waters of the Western Highlands and the Hebrides, as well as with many of the Irish loughs. Again, I often wonder why the extremely pretty Eider Duck (*Somateria mollissima*) has been so entirely ignored by the marine painter. What could be more effective than a small party of these handsome birds swimming just outside the surf on a rock-bound coast, riding buoyantly as corks on the curling crests of the waves, or diving through the huge green rollers just as they turn over to break in thunder on the beach? But here again the artist must be careful not to introduce this bird into pictures of southern waters, especially in summer, for it is not known to breed on our coasts south of the Farne Islands. Another bird which should be a special favourite with the marine artist is the Oystercatcher (*Hæmatopus ostralegus*). Its black and white plumage, orange-coloured beak, and pink legs and feet make it a conspicuous object on the shingly shore, as it runs along by the margin of the waves.

On the wild northern moors close to the sea the Skuas have their home. These birds are readily distinguished from the Gulls by their brown colour and cuneiform tails. The Great Skua (*Stercorarius catarrhactes*) is readily identified by its large size,

uniform brown colouration, and only slightly prolonged central tail feathers, which do not project more than an inch beyond the outer ones; Richardson's Skua (*Stercorarius richardsoni*) is distinguished by its long central tail feathers and lighter underparts. These two Skuas are the only ones that breed in the British Islands, but two other species occur here on abnormal migration. Then we have the various species of Petrel, all possessing well-marked characteristics, which may be effectively introduced into suitable marine paintings. The tiny Stormy Petrel (*Procellaria pelagica*), with its square tail; the Fork-tailed Petrel (*Procellaria leachi*), with the tail forked; whilst in both species the white basal half of the upper tail coverts is very conspicuous during flight. The Shearwater (*Puffinus anglorum*), with its strong contrast of black and white plumage, short tail, and narrow scythe-shaped wings, is a familiar object of the open sea. Nor must we fail to notice the many species of Sea Ducks and Geese that enliven our low-lying coasts in winter, all of which may be readily portrayed and endowed with individuality by the artist who carefully studies them. Wild Swans and Geese are grandly effective birds, say when standing alert and watchful on the low sand-banks at

dawn or dusk waiting for the ebbing of the tide. The Cormorant (*Phalacrocorax carbo*) and the Shag (*Phalacrocorax graculus*) may be introduced with greatest effect into a picture of ocean rocks, either as the birds are sitting basking in the bright sunshine, often with wings outstretched, or near their nests and roosting-places in the ocean caves and on the ledges of the cliffs. The latter bird is easily distinguished from the former by its smaller size, green tints, and, in the early breeding season, conspicuous frontal crest of recurved feathers. It has also only twelve tail feathers, the Cormorant possessing fourteen. The Cormorant has the bare skin of the face and throat yellow, whilst in the Shag it is black. The Gannet (*Sula bassana*), in its snowy plumage, is another bird belonging to this family, and one singularly effective either when in the air or seated on the rocks. Gannets fishing in the deep blue waters of a northern sea would make a grandly effective subject for the marine painter. The pretty Ringed Plover (*Ægialitis hiaticula*) and the Turnstone (*Streptilas interpres*) are also birds of a sandy shore appealing strongly to the artist's careful treatment. But sufficient has been said to suggest any number of striking studies to the marine artist, and to enable him to introduce

an element of much-needed variety into his works.

I pass now to the landscape painter's portion of the subject. Here the choice is even more extensive, but the artist has sadly neglected his opportunities. Almost every landscape admits of the introduction of bird-life in some form, and many phases of bird-life contain all the elements for most effective studies. I pass over most of the smaller species—not because they are any the less worthy, but because their small size is an obstacle to their successful artistic treatment, unless drawn specially and life-size. What an infinite variety of subjects might be selected, for instance, from the Raptores, or Birds of Prey: the Golden Eagle (*Aquila chrysaetus*) amongst the mountain crags—not in the act of attacking healthy birds or beasts much stronger and more pugnacious than himself, but either standing on some favourite crag in solitude, or striking the weak and defenceless lamb or death-stricken beast; or, yet again, at his eyrie far up the beetling cliffs: the White-tailed Eagle (*Haliaëtus albicilla*), sailing proudly over the mountain lochs, or beating about the sheep farms and the coasts in quest of carrion: the Peregrine (*Falco peregrinus*), all dash and vigour and nervous excite-

ment, watching the sea-birds, the rabbits, and the wild-fowl, or swooping after them in all the heat and pride of chase: the Buzzard (*Buteo vulgaris*), sluggishly beating along the uplands in quest of small and weak defenceless animals: the Sparrow Hawk (*Accipiter nisus*), dashing along the hedgerows at dawn or even in quest of small Finches: the Kestrel (*Falco tinnunculus*), high up in the blue sky, floating on quivering wings and outspread tail, surveying the meadows and the stubbles below for mice: the Osprey (*Pandion haliaëtus*), making a meal off a captured fish, or striking at its finny prey in the clear blue mountain lakes or lowland broads. The Owls also are remarkably telling subjects for the painter. What more noble-looking than the Eagle Owl (*Bubo maximus*), or the Snowy Owl (*Surnia nyctea*), in the act of chasing the smaller mammals, or at rest, either in the branches of the pine trees or on the rugged rocks? Both these birds, it should be remarked, are only very rare stragglers to our islands. The Tawny Owl (*Strix aluco*) may be happily introduced amongst ivy; whilst the Barn Owl (*Aluco flammeus*) is just as much at home near ruins, barns, or steeples. All these birds possess well-marked characteristics and much contrast of colour, which not only

renders their representation easy, but very effective too.

Several of the smaller birds lend themselves admirably to the painter's art. What, for instance, can we select more beautiful than a Sky-Lark (*Alauda arvensis*) soaring upwards to the zenith, vignetted in blue ethereal space? But the bird must be faultlessly drawn, and the idea of motion correctly conveyed, otherwise a charming subject will be irrevocably spoiled. Swallows and Martins also admit of artistic treatment, and may be introduced into almost any kind of landscape with advantage. But let us have the Swallow (*Hirundo rustica*), with its nearly uniform steel-blue upper plumage and dark band across the chest, extremely narrow and elongated outer tail feathers, and bright chestnut forehead and throat; the House Martin (*Chelidon urtica*), with white underparts and upper parts steel-blue, except the rump and some of the upper tail coverts which are white, forming a conspicuous patch when the bird is flying, the tail short and deeply forked, but the outermost feathers not elongated. The Sand Martin (*Cotyle riparia*) is the least attractive and conspicuous in its plumage, being brown above and white below, except a brown band across the chest. The Wheatear (*Saxicola*

œnanthe) and the Pied and Yellow Wagtails (*Motacilla alba yarrellii* and *M. raii*) are also birds of bright and strongly contrasted plumage, that may be introduced into landscapes with advantage. We find the Wheatear on downs and upland wastes; the Wagtails on the fallows and pastures, often running about near to feeding cattle, and by the margin of ponds and streams. The various species of Crows may also be cited as well adapted to the artist's needs. Almost every kind of scenery is frequented by one or other of these birds. The pastures are the chosen feeding-grounds of the Rook (*Corvus frugilegus*), distinguished by its purplish black plumage and bare warty face; the Carrion Crow (*Corvus corone*) is a bird of the woods as well as the wilderness, and differs from the preceding in having greenish reflections in its plumage, and the face covered with feathers; the Hooded Crow (*Corvus cornix*), with its mixture of black and grey plumage, frequents the low meadows and swampy shores of estuaries during winter, and the Highland sheep farms in summer; the Jackdaw (*Corvus monedula*), notable for its small size, rounded wings, and gray nape, is a bird of the ruin, the cliff, and the hollow tree. The Magpie (*Pica caudata*), with its characteristic and familiar garb, frequents the

fields and coppices, and is often seen perched on the back of a sheep or cow; the Jay (*Garrulus glandarius*) is another remarkably handsome bird of the woodlands; and the black-coated Chough (*Pyrrhocorax graculus*), distinguished by its long slender red bill and legs and feet, may be introduced with effect into the pastures near the sea along our western coast-line. The Starling (*Sturnus vulgaris*) is another bird adapted to the landscape painter, its characteristic attitudes being very effective. The beautiful mottled plumage of the Goatsucker (*Caprimulgus europæus*) appeals strongly to the artist's pencil—in fact, what could be more effective than a study of bracken and fern, or a moss and lichen covered branch, introducing this charming bird as he is at home, dozing away the hours of daylight, waiting for the dusk, when he starts up in quest of food? Let the artist be careful, however, should he elect to paint him on a branch, to place him perched along, not across it. Attention may also be drawn to the various species of Pigeons, all inhabitants of special districts, and each possessing well-marked characteristics. The Game birds, too, must not be neglected—not as dead trophies, but as living creatures full of interest and charm. The Pheasant (*Phasianus colchicus*),

the Partridge (*Perdix cinerea*), and the Red Grouse (*Tetrao scoticus*) are too well known to need further comment; but high up on the mountain tops the Ptarmigan (*Tetrao mutus*) has its home. This Grouse is mottled brown of various shades in summer, but in winter assumes a snow-white dress for the sake of protection from various predaceous creatures. It then closely resembles the Willow Grouse (*Tetrao albus*), a bird imported into this country in large numbers for food; but the artist will find a point of distinction in the narrow black stripe through the eye of the male Ptarmigan. He will also be careful to note that in winter the toes of the Ptarmigan are covered with thick feathers, almost hiding the claws, but in summer the greater part of the toes is almost bare. The Black Grouse (*Tetrao tetrix*) and the Red-legged Partridge (*Caccabis rufa*) also deserve the attention of the landscape painter. That magnificent bird, the Great Bustard (*Otis tarda*), is now, alas! exterminated from its British haunts, but I see no reason why a bird of this species should not be introduced into a picture of Salisbury Plain, once its favourite home.

Passing notice must be given to the various species of Plover and Sandpiper that frequent the uplands in summer and the low coasts in winter—

the Curlew (*Numenius arquata*), the Godwit (*Limosa rufa*), and the Phalarope (*Phalaropus hyperboreus*) being especially beautiful and chaste. Pass now to the graceful Herons. The Common Heron (*Ardea cinerea*) requires no introduction to the painter; it is a bird eminently suitable for river scenery. Then we have the Great White Heron (*Ardea alba*), the Little Egret (*Ardea garzetta*), the Squacco Heron (*Ardea comata*), the Bittern (*Botaurus stellaris*), and the Crane (*Grus cinerea*), all lending themselves admirably to the artist's purpose, and forming fitting ornaments to the several scenes they frequent. In addition to the Waterhen (*Gallinula chloropus*) and the Coot (*Fulica atra*), must be mentioned the Corn Crake (*Crex pratensis*), the Spotted Crake (*Crex porzana*), and the Water Rail (*Rallus aquaticus*), species either found in the grass meadows, or on broads and reed-fringed pools. Many species of Ducks also claim attention from the landscape painter—the Wigeon (*Anas penelope*), the Teal (*Anas crecca*), the Shoveller (*Anas clypeata*), and the Tufted Duck (*Fuligula cristata*), all being inhabitants of inland waters during the greater part of the year. Let us see no more flocks of Wild Duck in summer. A party of these birds rising from

among the rushes, all brown and dead, and swaying mournfully in the wind, growing round a half-frozen pool, say just as the sun is dipping behind a mass of crimson cloud—this would form a subject true to life in every detail, grandly effective, and portraying Nature as she is, and how she may be seen on any day in midwinter by the artist who cares to make the observation.

Let not the artist rest content with British birds; there are plenty more beyond the seas even better adapted to his treatment. A study of Vultures in the desert; Ostriches being stalked by some of the large carnivora; Storks in the meadows, or standing on the masonry of temples and mosques; Pelicans, Flamingoes, and a host of others, all remarkably effective. Again, what artist has yet portrayed the glorious dress of the Humming Birds, the metallic splendours of the Sun Birds, the rich and loricated hues of the Birds of Paradise, and a hundred others equally grand, effective, and beautiful? Want of space prevents me going into further details of this branch of the subject, but I trust sufficient has been said to call the artist's attention to many birds hitherto beyond his notice.

The mention of Humming Birds brings me to

the subject of portraying birds in motion. How rarely do we see this correctly done. With some, especially small species, the wings are beaten too rapidly to present any definite shape; and yet we invariably find that when any of these smaller birds are depicted in the act of flight, the artist most erroneously draws the wing in detail and outline just as though it were at rest. The body and tail of the bird are all that can be seen definitely; the wings appear but haloes of vibrating rays, looking like puffs of mist on either side, so quickly are they moved, just as is the case with the wings of a moth or a fly. Larger birds, as a rule, fly more slowly, and the wing-beats are more deliberate; moreover, they often skim or sail for some distance with no apparent effort with the pinions held still and expanded—note the rapid change in the appearance of the wings of a Partridge or a Pigeon as the bird skims or swoops, after flying directly with the wings rapidly beating. A loitering, skimming, or hovering attitude should therefore be selected by the artist in every case when a flying bird is represented, and great discrimination should be used in selecting species for portrayal in the air.

Apropos of ideal scenes of bird-life, the question may possibly arise—Should the artist be allowed

sufficient licence to prevaricate truth for the sake of effect? I think not. Abundance of effect can be obtained in a legitimate manner from Nature as she is—not as she might be. Again, so far as regards these works in which it is obvious that the artist has drawn on his imagination for his subject, the inaccuracies prove the meagreness of his observation, and unerringly brand them as ideal compositions. Such pictures almost invariably introduce us to birds under the most exceptional circumstances, surrounded by impossible accessories. So long as such a false system of work prevails we shall never arrive at any great standard of accuracy. When the artist begins to observe the birds in their native wilds, and to paint them as they are at home, all ideal composition will be discarded for the genuine subjects, which are infinitely more interesting than any he may invent or compose. With regard to attitude, the artist is quite justified in painting a bird in any position he may choose, and so long as the bird is drawn correctly, he is beyond the reach of criticism; but when he makes a subject of his work—when his bird is surrounded by accessories—then we must demand harmonious accuracy in every detail.

So far as the artist's birds are concerned, too

much detail may be objected to, because a want of uniformity with surrounding objects would often result. The question of detail largely depends on circumstances. It would be manifestly absurd to enter into minute details of plumage when the bird is introduced on a small scale, or amongst surroundings where breadth of treatment prevails. The bird should harmonize as nearly as possible with the degree of finish to which the entire subject is brought. It must, however, be remembered, that, even without entering into minute detail, a bird can be admirably and truthfully depicted, all that is necessary in such a case being the few characteristic "touches" that endow each and every species with individuality. On the other hand, when the bird itself forms the dominant idea in a work of art, it should be drawn with careful detail and with a high degree of finish—which can be done however small the scale may be. Then the accessories should also receive a proportionate amount of detail in their treatment.

The value of bird-life to the artist is unquestionable, whilst among animal life he has even wider scope for his skill. Natural history never was so popular as it is at the present time. Nature has been familiarized by such illustrious teachers

as Darwin and Wallace; whilst the portrayal of these beautiful objects of her handiwork has risen to the dignity of Art in the sense of its fullest and broadest meaning. The stereotyped studies of "stags" and "dead game" are well-nigh exhausted. They do not satisfy the demands of a nature-loving public. There is too much sameness in their treatment; many other objects of the animal world, especially in the kingdom of the Birds, more beautiful, more interesting, and more effective, await the artist's skill, which will draw together in still closer bonds of unity the realm of Nature with the realm of Art.

VIII.

IN DEVONSHIRE LANES.

No other county throughout the length and breadth of the British Islands can equal Devonshire for lanes. They wind in endless mazes across the green country, over hill and dale, crossing each other, and branching out on either side like leafy tunnels of foliage, cool and damp, mossy and lichen-draped, green as emeralds. Whither all this wilderness of lanes leads is ever a puzzle to him who wanders through them. He may choose one for his route, but is soon placed in a quandary by arriving where a choice of two is presented, each as attractive as the other. Whim or fancy decides the point; but a little further on a cross-road, or perhaps a junction of half-a-dozen leafy ways plunges him once more into a fit of hesitation. More likely than not there will be no welcome sign-board to point the road to anywhere. Each solitary way has some particular charm to tempt him into its arched green portals; yet whichever

one be chosen will quickly lead to many another call for choice. A typical Devonshire lane has tall banks of earth on either side clothed with grass and herbs, flowers and ferns and brambles; the top of each bank is crowned with a more or less dense hedge of varying height, the twigs and branches from each interlacing in many places. The wonderful luxuriance of the ivy, mosses, lichens, ferns, and other vegetation testifies to the humidity of the Devonshire climate, and also to its exceptional mildness—a climate that admits of the wild strawberry and the scabious being in bloom at the winter solstice, and allows a host of plants to retain their vitality and verdure throughout the year, that in less favoured districts shed their leaves and die completely down in autumn.

From the naturalist's point of view these lanes are ever attractive and interesting throughout the year; summer or winter the wild life in them proves a perennial charm, but never are they more alluring to the lover of Nature than in the leafy months of May and June. It is then the lanes of Devonshire look their fairest and their best. The foliage still retains that delicate shade of green peculiar to its youth and to the spring. The hazels, elms, and sycamores are in their fairest array; the thickets

of bramble and briar, of honeysuckle, wild clematis, and whitethorn are clothed in greenery of the emerald. On either side the high steep banks are still gay with the last of the primroses; everywhere the white and radiant star-flower, the vivid blue speedwell, and the paler-hued forget-me-not gleam in brilliant patches of colour amongst the setting of almost universal green. Everywhere the ivy grows in astonishing abundance. Here and there the bluebells clothe the wayside with an azure carpet, and the unpleasant pungent odour of the white-flowered garlic taints the air; whilst the blooms of the crane's-bill, the ragged robin, the wild strawberry, and saxifrage gleam in contrast with the rest. The ferns are full of vitality; every bank is garnished with the long narrow leaves of the hart's-tongue,—the ribbon-fern of the country folk,—the slender stems of the bracken, or the more delicate leaves of smaller and more fragile species. Here and there great tufts of hard fern are firmly rooted in the crevices of the mossy bark high up the trees and on the broad horizontal branches—another indication of the humid atmosphere. Insect life is now abundant. Flitting and dancing among the flowers of the wayside we may notice the gaudy buff-tipped butterfly, the even more ubiquitous

meadow brown, and the delicate little blue; now and then the gloriously-arrayed peacock or admiral skims past on more powerful wings, mounts the hedges, and is gone on its mazy way before we have time to admire its painted charms. Bees of many species search the blooms for hidden sweets; whilst the pretty banded shells of various sorts of *Helix* garnish the grass and leaves. Life is everywhere; in countless variety of forms it is constantly appealing for admiration and scrutiny.

Here in these lanes we may wander in perfect seclusion by the hour together without once meeting a human being. The variety of scene is constant. Past sleepy little village after village; past cosily-thatched farmhouses and cottages, almost buried in flowers and foliage, and under whose eaves the swifts are ever gliding and screaming, our route along the lanes will lead us. Every now and then a peep is obtained at some orchard, the trees not yet quite stripped of their pink-and-white bloom, or across the wide expanse of fields and woodlands at the far-away blue sea on the one hand, or the gray heights and blue, misty outlines of the distant tors and ridges of Dartmoor on the other.

Sometimes where the lane widens out into a bit of waste common land, now decked with yellow

gorse, we may meet with a party of caravan folk encamped for the night. The law, we believe, as it now stands only allows these nomads the privilege of staying one night at any given place by the wayside. They must move off again next day. If the hour be early we may meet their hobbled horses grazing along the lane; and the smell of the blazing fire of faggots taints the fresh morning air afar. I met with such an encampment only yesterday. It was soon after sunrise, and but one man was astir. He sat busily engaged making clothes-pegs by the fire, keeping careful watch meanwhile over a big iron pot in which a savoury breakfast was cooking. What stranger could guess the contents of that mysterious utensil? The meal may have been hedgehog, perhaps rabbit, perhaps Pheasant, or even fowl, flavoured with herbs and cooked with all a gipsy's cunning. Beneath the van two children lay fast asleep, only their brown curly heads being visible under the pile of rags that covered them. Visions of overcrowded rooms in the slums of darkest London involuntarily rose before me as I contemplated these sleeping children here, with the blue sky for their canopy, and all fair Devonshire for their habitation. Such a life has its hardships and its seamy side no doubt, but

it has the immense advantages of fresh pure air, variety of scene, and a sense of liberty and freedom that no town dweller can ever realize. The ethics of caravan life may be rather loose, and the young gipsy may be taught from his cradle (should he ever have been blessed with such an infantile luxury) that game and rabbits are as much the poor man's as the squire's; yet, after all, there is more to be said in favour of his snaring a rabbit or strangling a Pheasant than there is against the London gamin's act of picking a pocket or rifling a till.

But we must hasten on along the lanes under the meeting canopy of the hedges, past the coppices where the woodmen are already at work peeling the bark from the oak-trees, and making themselves hungry as Hawks with their healthy labour; on by the broad red-earth fields which patient plodding teams are tilling for mangolds; past the swampy corners where the golden spikes and broad green sword-shaped leaves of the iris hide the pools where the cattle drink; on and on, along lane after lane, where almost each step displays some fresh object of interest to him who loves Nature and Nature's haunts. The lanes are now melodious with the songs of birds. True, no Nightingales enthrall us

with their songs of sighs, for Devonshire is too far to the west of the Nightingale's line of northern flight, and the south-west peninsula of England, although, so far as we can see, suited in every way to the bird's requirements, as yet remains deserted. The day may come, however, when the Nightingale will gradually increase its range in this direction; indeed, signs are not wanting that this emigration is slowly taking place. At one time, almost within the memory of the present generation, the Starling was a rare bird in Devonshire, now it is one of the commonest species in the county, having steadily increased its western breeding area in England. In the lanes, however, there are Warblers enough to make the hedges ring with gladsome music from dawn to even. Here the Blackcap warbles from the meeting branches overhead, now on a topmost spray, then from some cool shady nook among the leaves, perhaps just above the thicket where he and his mate have slung their tiny net-like cradle which already contains their spotted eggs. This Warbler is remarkably common in many parts of Devonshire, especially in spring—April—when numbers pass the county on their way to more northern haunts, lingering here and there for days together. I have remarked

the same abundance of this species in autumn, but not to such a marked extent. The Whitethroat is also common enough in the lanes, his garrulous song and scolding call-notes being one of the most familiar sounds of the hedgerows. Here, also, the rare and local Cirl Bunting chants his simple song from the elm-trees. He is more of a tree-haunting bird than his cousin, the Yellow Bunting, and his little song wants the prolonged final note which is so characteristic of that of the commoner species. There is an unusual interest attaching to the Cirl Bunting, for it was in Devonshire that Colonel Montagu ninety-three years ago made the discovery that it was a British bird, and here amongst the fields and hedgerows collected the information concerning this species that enabled him to give to the world so full and so correct an account of its life-history.

Here also in these lanes the Chiffchaff, first of all the Warbler band to reach us from Africa in spring, sits and chants his monotonous music all the livelong day. Occasionally, so mild is the climate of the south-west peninsula, a few Chiffchaffs remain the winter through; and by the beginning of March the little brown singers begin to appear with almost unfailing regularity, quite from three

weeks to a month before I ever heard them in Yorkshire. The Thrush and the Blackbird dwell in plenty in the hedges of the lanes, and may be met with all the winter through, an interesting fact, especially as regards the former species, which leaves so many other districts entirely in mid-winter. In the fields on either side of the lanes the sweet-voiced Sky-Lark climbs upwards on throbbing wings towards the silvery clouds, scattering broadcast its fountain of lovely song. There, too, by the wayside we may notice the Red-backed Shrike, sitting warily on the topmost spray of the hedge, alert and watching for the beetles that may chance to drone lazily by. A provident bird is this, spitting such captures as he cannot eat on thorns in the hedges, and keeping a larder from which to draw food at will. Just now in early June you may find his nest, usually made in the tallest part of the hedge, and with no attempt at concealment. Pairs of these birds will frequent one chosen spot for years, coming each spring from winter quarters far south of the equator in Africa.

From time to time the voice of the Cuckoo sounds near and far; and in some of the nests we visit we may be fortunate enough to find either the egg or the newly-hatched young of this parasitic

bird. Now and again he starts from the trees by the lane-side, and flits across the fields in an unwavering course, looking all wings and tail as he flies along, and presently his clear rich notes are uttered as he nears the trees and disappears within their dense leafy crowns. It was but yesterday I peeped into a Hedge Accentor's nest wherein the curious tragedy of the Cuckoo's reproduction had been successfully played. The nest was so situated in a gorse-bush, that the hen Cuckoo had been obliged to carry her egg in her mouth and drop it in, choosing a time of course when the dupes of owners happened to be away. In due course the eggs were hatched—two Hedge Accentors and the young Cuckoo. A day or two after this event the young Accentors mysteriously vanished, and the nest remained in the sole possession of the young Cuckoo. Already the bird is too big for the tiny nest, and both the silly Hedge Accentors are toiling from dawn to dark to feed the youngster, whose appetite daily grows more voracious. Soon the young Cuckoo, still unable to fly, will sit outside the nest to be fed by his foster-parents.

But evening is now at hand ; already the Finches and the Blackcaps have hushed their music and sought a roosting-place. Still the Thrushes sing

on into the twilight ; and the swampy corners of the lanes and the tangled thickets near the ponds are resonant with the song of the Sedge Warbler. All night long, in one almost unbroken strain, these industrious little singers warble from the osiers and the reeds, especially during the warm still nights of May. Indeed May is a month of song, the most musical, perhaps, of all the twelve, like the glorious finale of some mighty orchestra ; and during June and the first few weeks of July the melody of the lanes will pass almost imperceptibly away.

Another period of the year, when many of our Devonshire lanes are specially attractive to the ornithologist, is in April. Migration is then in progress, and the careful observer may obtain entrancing glimpses of the wonderful phenomenon. Certainly the lanes nearest to the sea are by far the most interesting so far as regards the arrival of migratory birds. The dense cover they afford forms the attraction, and after a migration night they frequently swarm with a variety of species. I have remarked this specially to be the case after a rough and stormy night, as if the weary birds were glad to rest for a time in the nearest cover so soon as they have safely reached the land. The previous evening may show a great scarcity of birds in the

lanes, even the resident species keeping close and silent owing to the rough, unsettled weather. By sunrise the next morning, however, a great change is frequently apparent to the most casual observer, and every few yards birds may be flushed from the cover. Here, for instance, is a note I made on the 23rd of April, 1891: "The lanes near the downs this morning are swarming with birds. The night has been stormy but moonlight, with a strong wind from the south-east. As I walk along the lanes birds start up before me almost at every step, and all of them species that were undoubtedly absent yesterday — Wheatears, Willow Wrens, Blackcaps, Redstarts (very abundant), Garden Warblers, and Cuckoos. Many of them fly with great reluctance, as though tired out with their stormy journey across the Channel last night. One little wanderer was exceptionally interesting, a Pied Flycatcher, which had evidently come over with the great rush of migrants, and had been blown by the unusual wind pressure far to the westward of its usual course to the British coasts. It was exceedingly tame, and flew before me down the lane, occasionally taking short flights, and then settling again on the outer twigs of the hedges. Now and then it alighted on the road and allowed me to approach within half-a-dozen yards; it was

quite alone, and never once uttered a note. I also remarked a solitary Grasshopper Warbler. With the exception of the Redstarts, which uttered their Chaffinch-like call-note, these migrants were remarkably silent. It is very possible that none of them indulge in song until the usual breeding-stations are reached."

One very remarkable fact about these periodical arrivals of migrants is, that the birds rarely stay more than a day in any particular district. More especially is this the case with the later arrivals of species that appear early in our islands and remain here in Devonshire to breed. The earlier individuals soon spread over their accustomed haunts; these later bands are chiefly composed of individuals that breed in more northerly areas, and merely rest in our lanes apparently to gain strength ere passing on again. Thus the lanes that swarm with the migrant hosts one day are generally deserted to a bird the next. The pilgrim crowds have passed on during the interval of darkness, and we see them no more. I have also remarked that these bird-waves have frequently coincided with great rushes of migrants at the Eddystone Lighthouse, whilst the coasts for many miles have exhibited an abnormal number of birds, one very convincing proof of the

vastness of the flight. I have also repeatedly remarked that certain lanes are more specially favoured than others year by year as resting-places, which fact to my mind very clearly proves how closely, how very closely birds follow certain routes to which they have become thoroughly accustomed by years and years of migratory experience.

Many interesting glimpses of the Kestrel and the Sparrow Hawk may be obtained in these lanes. During the present spring, for instance, I stood for nearly an hour watching the movements of a pair of Kestrels, and saw this pretty Hawk engage in actions I had never witnessed before. The lane I watched from was on a hill-side; at the bottom of the hill another lane ran parallel to it, with a small stream by the hedge. Time after time I watched the female bird flutter along this ditch, which was not more than a couple of feet in width, skimming a few inches above the water, and after each flight return to an old stump to rest, and apparently to watch. Exactly the same manœuvre was repeated many times until a frog or a mouse was captured—I was too far away to make out which—and borne off in triumph to the adjoining wood. I have never previously known the Kestrel hunt systematically so close to the ground as this.

Our lanes are also by no means devoid of birds in winter-time. True the number of species is fewer, and the abundance or rarity of individuals is ever fluctuating. At this season most birds are more nomadic in their movements, more socially inclined, and seem to prefer to wander up and down in companies. Now the various hard-billed birds, such as Finches and Buntings, become perceptibly more numerous; the Titmice especially are increased in numbers. Then we may wander far down the lanes without scarcely seeing a single bird, until we meet with the social nomads in a mixed and merry flock; yet the Wren, and the Robin, and the Hedge Accentor keep closely to the hedges throughout the year, and gladden the winter with their cheerful song.

IX.

SEXUAL SELECTION AND THE NESTING OF BIRDS.

AMONGST the various criticisms which have been made on my *Contribution to the Philosophy of Birds' Nests and Eggs*, a paper which was first read before the Sheffield Literary and Philosophical Society in 1881, and afterwards published in an enlarged form in the *History of British Birds*, and again in my work on *Our Rarer Birds*, that of the distinguished American ornithologist, Mr. J. A. Allen, in *The Auk*, is hitherto the most important. In order chiefly to direct attention to this little known subject, and with the idea of stimulating observation, I venture herewith to reply to the most salient points of Mr. Allen's criticism.

In the first place, Mr. Allen seems to think that so far as concerns such birds in which the male is bright and the female dull in colour, and which nidificate in an open site, the "glaring exceptions"

he instances are sufficient to upset any theory of "protection" that might be based upon the interesting facts. Now I was under the impression that in my essay I had been particularly careful to deal with these exceptions to the general rule, and had offered what I believed to be a plausible and logical explanation of them in my division: "Birds in which both sexes are dull in colour, and which build covered nests from motives of safety other than concealment." It seems to me, however, that Mr. Allen has been singularly unfortunate in the selection of the instances which he is pleased to call "glaring exceptions" to this rule. His first, the Mandarin and Wood Ducks, *Aix galericulata* and *Aix sponsa*, of China and North America respectively, may possibly nest in trees, either because the down of the female is light in colour and consequently conspicuous; or because the male, contrary to most species of the Anatinæ, keeps close company with the female after she has commenced to sit (Conf. *Water Birds of North America*, ii. p. 14). Of his second exception, the birds in the genus *Clangula* (Golden-eyes), it seems almost an incontestable fact that the paleness of the female's down is the reason why the eggs are hatched in a covered site. So that really these exceptions are not excep-

tions at all, and of course come very naturally under my division: "Birds in which both sexes are brightly coloured, and which rear their young in holes or in covered nests." Of Mr. Allen's third exception, the Sheldrakes, or what British ornithologists call Mergansers (*Mergus*), the down of these birds is pale in tint, and would be most conspicuous in an open site, and therefore the same remarks apply as to the birds in *Clangula*. With regard to the Grosbeaks, a group in which the brilliantly coloured male is said not only to sit upon the open nest but even to sing whilst doing so, I must retort by pointing out the fact, that these birds generally nest in dense cover, where the sitting bird is admirably shielded from view by the surrounding foliage. This latter exception, however, comes more naturally into that group which I designated as "Birds in which the plumage of both sexes is showy or brilliant in colour, and which nidificate in open nests," if both sexes are known to incubate. The male Blackcap performs his share of the duty of incubation, and he also repeatedly sings while sitting on the nest, but he is so well shaded by surrounding vegetation that he is hidden from enemies, and may do so with impunity. The male Blackbird will also occasionally sit on the nest in the female's absence, but he is so

well concealed that little absolute risk is incurred. Here I might record an exceptional instance of mimicry practised by this species, and which only came under my notice a few days ago (April 1893). I found a Blackbird's nest wedged deeply amongst ivy growing thickly over a stump in a hedgerow. To conceal the rim of the nest the old bird had placed several large tufts of green moss round it, making it blend so beautifully with the green ivy leaves that nothing but the keenest scrutiny could detect the fraud! This is a wonderful instance of deviation from architectural type, and shows how readily a change in the entire nest-building habits of a species could be initiated.

I am quite prepared to admit that my researches into the little known subject of bird architecture and the colours of eggs are to a large extent hypothetical and not open to absolute proof; but in the entire absence of any better or more feasible explanations of the various complex phenomena, I venture to think that those already offered are at least scientific and logical, and in accordance with the advanced views of the present day. Certainly, Mr. Allen appears not to have anything to suggest in place of the theories advanced by Dr. Wallace and myself. I have already shown in my essay and elsewhere

that I believe Dr. Wallace has generalized too widely; therefore with that part of Mr. Allen's criticism I have nothing to do; but I would again strive to impress upon Mr. Allen and other naturalists the importance—the vast importance—of *community of origin*, in explaining many of the difficulties with which the nest-building economy of birds is surrounded. To explain many present anomalies in nidification we must look to a remote past, as I suggested in my essay—to the ancient history of dominant forms which in their long descent have undergone many vicissitudes (including the segregation of representative forms and species), and been compelled to change their habits, or alter the style of their architecture, and in some cases have retained a mode of nest-building which is now not apparently in harmony with their modified structure or plumage. Further, Mr. Allen must always bear in mind that it is the rule to find certain types of nests peculiar to certain groups or species, such being handed down from a common ancestor, which we can have no doubt were of vital importance to that ancestral form, and harmonized with the conditions of its existence. It is therefore only reasonable to expect to find anomalies amongst many species—to find exceptions to certain broad rules which are readily

explained if we look back to the past history of those species, as is reflected in allied forms.

Mr. Allen suggests that the only function of concealment is that of the eggs—not the sitting female. If this is admitted by a naturalist who does not appear to believe in Darwin's brilliant theory of Sexual Selection, his unbelief seems to the present writer to be condemned by his own statements. If the female bird be not kept dull and sombre in colour by such a vitally important function as the hatching of the eggs and the rearing of the young in safety, why, it may be asked, is she not equally as brilliant in colour as her mate? and if Sexual Selection does not give to him his brilliant dress, whence the gaiety of his attire? I hold with much of what Mr. Allen has to say respecting the colour of eggs; but I also insist that this colour is to a very large extent correlated with the plumage of the female. It seems probable that the colouring matter on birds' eggs is, or was at some more or less remote period, influenced by surrounding colours during the bird's period of conception. We well know that eggs closely resemble the colour of surrounding objects—the dominant colour of a bird's surroundings and haunts—greens with arboreal birds, sand colour and browns

with Plovers, Terns, Gulls, &c., which may possibly have been implanted on the egg during the conception and pregnancy. It is a curious and noteworthy fact, that the eggs of such birds as are nocturnal, or frequent holes, caves, and similar gloomy haunts, where all sense of colour is lost, are in the majority of instances *white*; whilst in such birds, belonging to groups in which the eggs are highly coloured, as incubate in covered or gloomy sites, there is a strong tendency to deterioration in the vividness and intensity of the markings, or even for them entirely to disappear. Protective colouring of plumage, or what we are apt to call Protective Colour, may have been influenced in a similar way. The peculiar birthmarks impressed on unborn children through various accidents or frights to the parent at the later stages of pregnancy seem in a measure to confirm this theory of colour on the eggs and possibly the plumage of birds. I also wish to state, that most of the exceptions to the general rules respecting the colour of birds' eggs illustrate very forcibly what I have endeavoured to impress upon the reader respecting the importance of keeping in view community of origin in investigating this subject. Broadly speaking, it is only amongst the more highly specialized forms of bird-life that we

find colouring matter on the eggs, as amongst the Accipitres, the Passeres, the Charadriiformes, Ralliiformes, and Galliformes. By far the greater number of birds that lay white eggs, in holes, are confined to the Picarian forms; and of those which lay white eggs in open nests, the Humming-Birds belong to that order, whilst the Pigeons and the Owls show many important affinities with it.

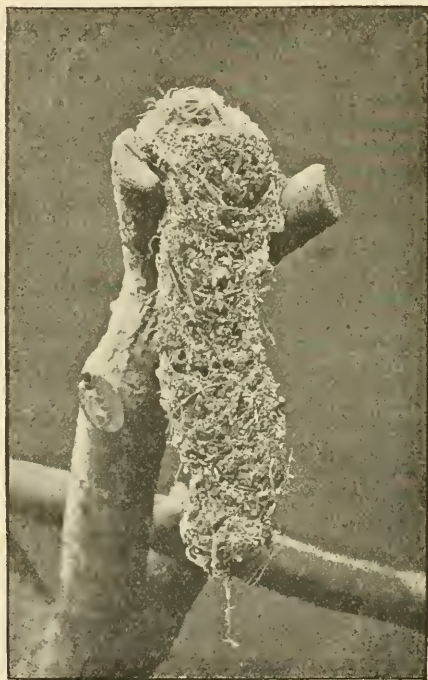
I now arrive at perhaps the most important if least satisfactory part of Mr. Allen's criticism, viz. that which deals with the mental powers of birds. If, as Mr. Allen suggests, we define Instinct as inherited habit, I venture to assert that it is not sufficient to explain the phenomenon of a young bird building its first nest. It implies that a young bird, hatched even in an alien nest, would be able to set to work and build a nest typical of the architecture of its species; it implies that that bird is born with a faculty for performing a most complex action; an amount of precocity which is far more astounding than any powers of imitation and memory that I have ascribed to birds. Mr. Allen cannot produce a scintilla of proof for his assertions—his Inherited Habit is even more of an hypothesis than that of Memory and Imitation. As I said before, it seems monstrously unfair to expect to find

inherited complex mental powers in a bird which we cannot find in the human race. If this theory of Inherited Habit be true, there is just one question I would wish to ask its propounders. How is it that a human being is not able to build himself a residence resembling in its architecture that adopted by his own peculiar race—an Esquimaux his hut, an Indian his wigwam, a civilized man his house or castle of this type of architecture or of that—unless he has some example to copy or some instruction to guide him in his task? As I said before, so I now say again, “If man is so helpless, why should not the poor lowly bird be the same?” That birds are possessed of wonderful powers of memory has been *proved* over and over again, and not memory alone, but powers of imitation too. Instance need not be given here; they are already known to readers of these pages. On the other hand, what proof do we possess in favour of blind instinct, what data to support hereditary habit?—none, absolutely none whatever, all is inference, all the purest hypothesis. What evidence we can gather all tends to explode this theory of Inherited Habit. Like most new theories it is being pushed too far, asked to explain too much, and made to account for phenomena which are much more plausibly ex-

plained in other ways. I do not for one moment doubt the potency of Inherited Habit in explaining many simple functions of an organism, such as a new-born infant sucking at the breast, a young Duck taking to the water as soon as it is hatched, &c.; but when we come to such a complicated proceeding as nest-building, a matter which requires much thought, instruction, and some experience, then I say Inherited Habit is carried too far.

Since writing my Essay on the Philosophy of Birds' Nests and Eggs, a very interesting instance has come under my notice, which seems absolutely to prove that blind instinct, or, to term it by its scientific equivalent, Inherited Habit, plays but a minor part in the art of nest-building. I recorded the instance in *Nature* (vol. xxxi., April 9, 1885) as follows:—"A remarkable instance, however, of a changed mode of nest-building has just been brought to my notice by Mr. W. Burton, the well-known naturalist of Wardour Street. Some time ago his brother (now employed at the Museum at Wellington, N. Z.) took out to New Zealand a number of young birds of our common native species, with the object of introducing them to the Antipodes. Amongst them were some young Chaffinches (*Fringilla cœlebs*). These were turned

out, and have thriven well in a wild state, bidding fair permanently to establish this charming little bird in our distant colonies. Some of the birds have built a nest, and to Mr. Burton I am indebted



(From a Photograph by W. H. Clarke, Wellington, N. Z.)

for a photograph of the wonderful structure they have woven. It is evidently built in the fork of a branch, and shows very little of that neatness of fabrication for which this bird is noted in England.

The materials with which it is made seem very different too. The cup of the nest is small, loosely put together, apparently lined with feathers, and the walls of the structure are prolonged for about eighteen inches, and hang loosely down the side of the supporting branch. The whole structure bears some resemblance to the nests of the Hangnests (*ICTERIDÆ*), with the exception that the cavity containing the eggs is situated on the top. Clearly these New Zealand Chaffinches were at a loss for a design when fabricating their nest. They had no standard to work by, no nests of their own kind to copy, no older birds to give them any instruction, and the result is the abnormal structure I have just described. Perhaps these Chaffinches imitated in some degree the nest of some New Zealand species; or it may be that the few resemblances this extraordinary structure presents to the typical nest of the Palearctic Chaffinch are the results of memory—the dim remembrance of the nest in which they had been reared, but which had almost been effaced by novel surroundings and changed conditions of life. Any way, we have here, at least, a most interesting and convincing proof that birds do not make their nests by blind instinct, but by imitating the nest in which they were reared, aided largely by

rudimentary reason and by memory. I have not the least doubt that, had these young Chaffinches been *hatched* in an alien nest in this country, and never allowed to see a nest typical of their species, or have any connection with old and experienced birds, the results would have been still more startling and strange."

Nor can I allow that Mr. Allen has disproved the theory of imitation and memory by extending it to animals much lower in the scale of development. Such members must and do possess considerable power in this respect. Besides, it must always be remembered that the young bird or animal profits by the old one's experience, and imitates to a great extent the work of its companions. "Inherited Habit" would be proved at once if Mr. Allen's young turtle sought by resistless impulse a similar place to deposit its eggs to that which its parents did before it, if it had been hatched away from its favourite sands and reared in strict seclusion from its kind. Inherited Habit is but another name for blind instinct; and to maintain that such an extraordinary power is the sole guiding influence in such a complex undertaking as that of building a nest, or of singing a song, can and does "border on absurdity." It ascribes to a *bird* a mental attribute

which a *man* does not possess, and furnishes it with a power which, if true, would be wonderful in the extreme. With birds as with man, such an art must be acquired by practice, tuition, imitation, &c. It is no more reasonable to suppose that a son will inherit his father's handicraft, than to presume that a bird is born with the perfect architectural skill of its parents.

To the present writer it is little short of astonishing how deeply-rooted this idea of blind, infallible instinct is, how widely it prevails, how readily it is accepted even by naturalists of some distinction. It must be thrust aside, destroyed, forgotten by every observer who desires to study the fascinating subjects of bird-architecture, avian song, and avian migration in the only way that will yield satisfactory results.

THE END.

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